RESEARCH INPUT FOR COMPUTER SIMULATION OF AUTOMOBILE COLLISIONS
VOLUME II
STAGED COLLISION TESTS NO. 1 THRU 5

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16. Abstract

Volumes II and III of this document summarize the Phase II research results of the measured experimental data generated to document twelve full-scale staged collisions. Volume II presents results for staged collisions No. 1 through No. 5 and outlines test plans and procedures used to document the events. The objective of the staged collisions was to develop a library of experimental data which could be used to validate accident reconstruction techniques such as SMAC and CRASH. The test matrix focused on data gaps identified in Phase I (Volume I) involving intermediate and subcompact size vehicles. Collision configurations include frontal, side and rear impacts with both cars moving at velocities up to 40 mph. The vehicle measured parameters including vehicle compartment accelerations (X,Y,Z components) angular yaw velocity, compartment pitch, roll and yaw angle, wheel angular velocities, steer angle and vehicle trajectory. Each collision was photographically covered with ten high speed 16 mm data cameras. Occupant injury criteria data were obtained on the driver and front seat passenger in the target vehicle (V2), according to FMVSS 208 requirements.

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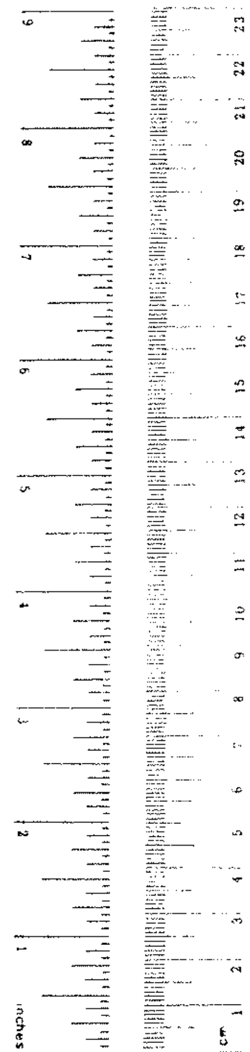
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

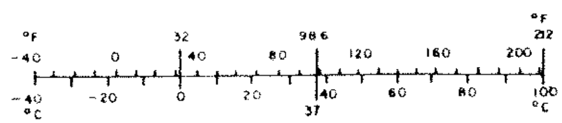
Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in ≡ 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



FOREWORD

This document summarizes the research achieved under Contract No. DOT-HS-7-01511, "Research Input for Computer Simulation of Automobile Collisions", with National Highway Traffic Safety Administration, U. S. Department of Transportation. Volume I summarizes previous existing experimental data from staged collisions and presents plans for future data needs. The experimental data generated in twelve staged collisions are reported in Volumes II and III of this document. Volume II contains the experimental test data for Test No. 1 through No. 5. Volume III contains the test data for Test No. 6 through No. 12. The reconstruction of these collisions, using the CRASH and SMAC simulation programs, is reported in Volume IV of this document.

The Contract Technical Manager for Phase II was Mr. Thomas Noga of the National Highway Traffic Safety Administration.

This report has been reviewed and approved by:

K. Hendershot

K. C. Hendershot, Head
Transportation Research Department

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LIST OF TABLES

THE ABOVE TABLES ARE TYPICAL OF THE TEST DATA REPORTED IN THIS VOLUME -(TESTS NOS. 1 THROUGH 5.)

1.0 INTRODUCTION

Volumes II, III and IV contain the Phase II research effort conducted by Calspan Corporation entitled "Research Input for Computer Simulation of Automobile Collisions" (RICSAC) for the National Highway Traffic Administration (NHTSA) under Contract No. DOT-HS-7-01511. The objective of this research is to further evaluate the validity and accuracy of both the Simulation Model of Automobile Collision (SMAC) and the Calspan Reconstruction of Accident Speeds on the Highway (CRASH) computer programs. These two computer programs have been developed for the purpose of achieving uniformity in the method of reconstruction and interpretation of the physical evidence in automobile accidents.

The Phase I of this research program, which is reported in Volume I of this document, summarizes the results of a detailed review of existing experimental data from staged collisions which had been previously documented and presents plans to meet future data needs in relation to computer simulations for reconstructing highway accidents.

The Phase II part of this program involved the staging and documentation of twelve car-to-car collisions at Calspan's Vehicle Experimental Research Facility (VERF). The staged collisions were performed on a 400 foot diameter level asphalt surface with an average dry skid resistance value of 87.

The objective of the staged collisions in Phase II was to generate a body of fully documented collisions which can be used to test reconstruction techniques such as SMAC and CRASH and serve as training aids for accident investigators. The test plan for Phase II was focused on data gaps identified in Phase I and on accident types that have high occurrence rates.

2.0 TEST PLAN

In view of the program limitation to twelve staged collisions, it was necessary to choose a test matrix between (1) achieving single severity test

results for a variety of vehicle size combinations or (2) obtaining response data in similar impact configurations for more than one value of speed-change, ΔV. The latter choice was selected as being more productive for achieving meaningful measures of the accuracy of reconstructions. In recognition of the current trend toward smaller vehicle sizes, the test program contained intermediate and subcompact categories.

The twelve collision matrix contained two categories of vehicle sizes, five impact configurations and two values of ΔV for each impact configuration. Each staged collision involved an intermediate and a subcompact size vehicle except for one test in which two intermediate vehicles were selected.

To insure the staged collisions are representative of real life accidents both vehicles were in motion at impact except for the rear impact configuration in which the struck vehicle was stationary.

The test matrix for the 12 staged collisions is presented in Table 2-1 and the five impact configurations are shown in Figure 2-1.

Based on the findings of the Phase I Final Report, presented in Volume I, "Research Input for Computer Simulation of Automobile Collisions," a test matrix was selected for the twelve Phase II staged collisions. The test matrix in Table 2-1 contains two of the most representative models of the categories of vehicle sizes, subcompact and intermediate. The impact conditions are defined by impact velocity, heading angle and vehicle contact point. All vehicles were 1974 models or newer.

2.1 Selection of Vehicle Speeds

The detailed selection of vehicle speeds was based on SMAC runs that were performed prior to each staged collision with the goal of achieving ΔV values for the struck vehicle of approximately 15 mph and 30 mph for the two exposures in each collision configuration. The objective of the two severity

TABLE 2-1

RICSAC-STAGED COLLISION

TEST MATRIX

TEST NO.	DATE 1977-78	VEHICLE MODEL V1 (BULLET)	VEHICLE MODEL V2 (TARGET)	IMPACT VELOCITY MPH	IMPACT CONFIGURATION (1)	CONTACT AREA (1)
1	11/3	Chevelle	Pinto	19.8	D-Front/Side	Forward c.g.
2	11/18	Chevelle	Pinto	31.5	Oblique-Offset	
3	4/18	Torino	Pinto	21.2	B-Front-Rear	50% Offset
4	4/25	Torino	Pinto	38.7	Oblique-Offset	
5	5/10	Torino	Honda	39.7		
6	5/22	Chevelle	Rabbit	21.5	E-Front/Side	Aft of c.g.
7	5/31	Chevelle	Rabbit	29.1	Oblique-Offset	
8	6/15	Chevelle	Chevelle	20.7	C-Front/Side	Forward c.g.
9	6/20	Honda	Torino	21.2	Perpendicular	
10	6/23	Honda	Torino	33.3		
11	7/7	Vega	Torino	20.4	A-Front/Front	50% Offset
12	7/12	Vega	Torino	31.5	Oblique-Offset	

Note: (1) For Impact Configuration and Contact Area see following Figure.

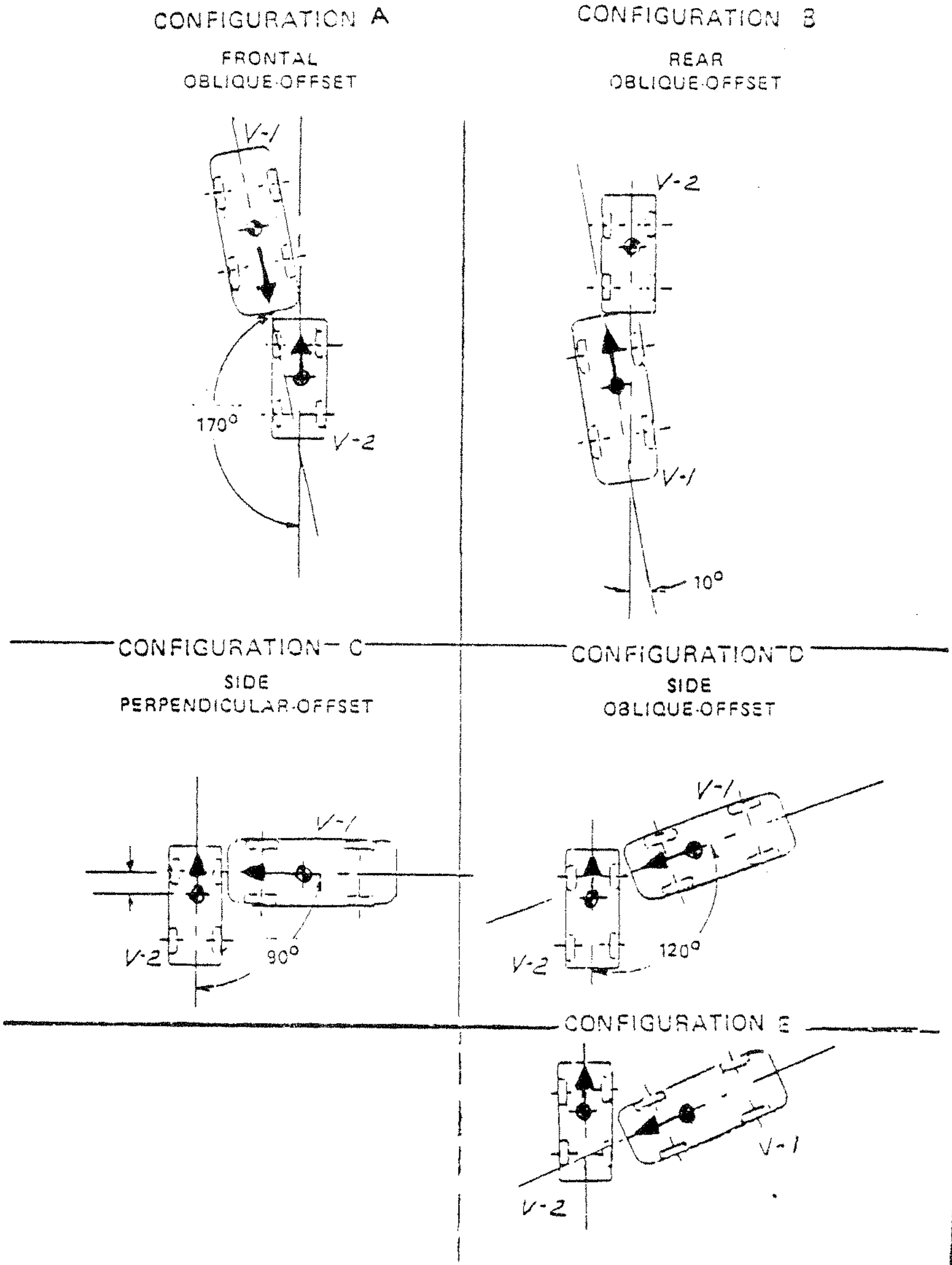


Figure 2-1 CAR-TO-CAR COLLISION CONFIGURATIONS

levels is to provide a basis for evaluating reconstruction accuracies over the ΔV range likely to be encountered in applications. For example, in side impact cases, data presented in Reference 2 indicate that approximately 90% of the struck vehicles in the MDAI files experience speed change of 30 mph or less and, further, that approximately 13% of the struck vehicles experience speed changes of 10 mph or less. Obviously, a realistic evaluation of application accuracies for such cases must include consideration of the indicated severity range.

2.2 Configuration Selections

A number of accident studies have included investigations of the distribution of collision configurations (e.g., Reference 3). In all such studies, frontal exposures have been found to rank first and side exposures second.

In view of the substantial representation of frontal collisions in the staged-collision data assembled in Reference 1, and of the fact that most collision configurations produce at least one frontal exposure, the selections include seven side impacts, two frontal and three rear enders. The two frontals were offset and oblique with the objective of producing both partial frontal contacts and yaw rotations during the spinout trajectories to permit testing of the corresponding aspects of reconstruction calculations.

Before conducting the scheduled staged collision, Calspan conducted a demonstrational test with two older vehicles to check out our recently improved towing and release system for oblique collisions with both vehicles in motion. Two cameras documented the performance of the towing and release mechanism of the towed vehicles.

3.0 VEHICLE INSTRUMENTATION AND PHOTOGRAPHIC COVERAGE

3.1 Vehicle Instrumentation

The selection and location of the vehicle instrumentation was based on the objective of generating experimental data in support of continued updating

and verification of the SMAC and CRASH computer programs. The instrumentation outlined for this program was selected with the objective of defining a minimum instrumentation package for use in future staged collisions related to accident reconstruction.

The vehicle parameters selected for documentation included the following items for each vehicle:

1. Acceleration - Three Components (XYZ)
2. Linear Velocity
3. Angular Velocity (Yaw)
4. Sprung Mass Pitch, Roll and Yaw Angle
5. Wheel Angular Velocities (RPM)
6. Wheel Steer Angle
7. Vehicle Trajectory During Contact and Spinout
8. NHTSA Crash Recorder

The selected standard vehicle instrumentation package is outlined in Table 3-1.

A minimum of 13 accelerometers were mounted on-board each vehicle to record acceleration components at six to seven stations on each vehicle as outlined in Table 3-1. At three locations triaxial (XYZ) packages were installed in each vehicle. These locations provide acceleration data at several locations between the front and the rear of the vehicle. All accelerometers were "hard mounted" to the vehicle structure.

The front wheel steer angle time history was measured on each vehicle by using a linear stroke potentiometer attached to the vehicle steering linkage. The output was calibrated in terms of wheel steer angle. The steer angle data

TABLE 3-1

STANDARD VEHICLE INSTRUMENTATION PACKAGE

VEHICLE ACCELERATION		DATA CHANNELS: BULLET VEHICLE 1	DATA CHANNELS: BULLET VEHICLE 2
Compartment			
Left Front Corner	(xyz)	3	3
Left Rear Corner	(xyz)		3
Right Rear Corner	(xyz)	3	
Rear Deck	(xyz)	3	3
Fire Wall	(xyz)	3	3
Front Bumper	(x)	1	
Door			
Left Front	(y)		1
Right Front - upper	(y)		1
Right Front - lower	(y)		1
Vehicle Attitude Package			
Pitch angle		1	1
Roll angle		1	1
Yaw angle		1	1
Yaw angle rate		1	1
Steer Angle		1	1
Wheel Angular Velocity		3	3
Trajectory Marker			
Front and Rear Axle		2	2
NHTSA Crash Recorder		1	1
	TOTAL	24	26
On-Board Brake Package		Yes	Yes
Two Spherical Roof Targets		Yes	Yes
On-Board Cameras		None	Min. 2

provide information needed to analyze vehicle trajectories during and after spinout.

Three or four wheel angular velocities were measured on each vehicle. No attempt was made to measure the wheel in direct contact with the striking vehicle because of the high probability of the transducer's destruction during the impact. The individual wheel rotation (rpm) time history was measured with an electrical tachometer driven by the angular rotation of the wheel. A flexible speedometer cable attached to the wheel hub was used to drive the tachometer mounted inside the vehicle. The flexible drive accommodates wheel steer angle and suspension deflection. Each tachometer was calibrated using a synchronous motor drive unit. This data provides direct measurements of the extent of individual wheel lock-up and braking action which occurs before and during the spinout phase of the collision.

The time history of the change in vehicle yaw, pitch and roll angles and yaw rate were recorded in both the bullet and target vehicles. A pair of two-degree-of-freedom, free gyroscopes and a rate gyro were mounted to measure the sprung mass attitude change of the vehicle axes with respect to a space-fixed reference axis system. The gyros, together with the solid state operational amplifiers were contained in a compact package capable of operating under an impact environment of over 40 g's.

Special attention was given to their orientation so as to minimize "contamination" of the signals due to cross-coupling effects of combined motions. One gyro was used in a vertical mode (spin axis parallel to vehicle vertical or Z axis) with the inner gimbal (axis athwartwise)measuring pitching and the outer gimbal measuring roll motions. The other gyro has its spin axis aligned parallel to the longitudinal axis of the vehicle for measuring heading angle. With the gyros so oriented, the gimbal pickoff signals are direct measurements of the angular coordinates of the sprung mass relative to the space-fixed axis system, except for yaw. The "contamination" of the yaw signal is considered minor because of the small magnitudes of the pitching and

rolling motions.

Vehicle Trajectory Marker

One of the more important data items requiring special attention was the documentation of the vehicle trajectories during vehicle interaction and spinout. The more traditional method to record the vehicle trajectory has been the use of several high-speed motion picture cameras located overhead on towers with supporting ground cameras at eye level height. To cover the complete event where major spinout occurs (in different directions) requires a rather large battery of cameras with overlapping field of views. Using several cameras to record the vehicle trajectory requires major effort in film analysis to establish a true trajectory. Parralax corrections within the field of view are a major concern requiring special procedures to minimize this error before an X-Y plot of trajectories can be obtained.

Based on the limitations and problems associated with the camera method for obtaining trajectories, Calspan designed and fabricated a special vehicle trajectory marker which proved to be a more direct method requiring considerably less effort in data analysis to obtain the desired X-Y plots. This method sprayed a liquid from the vehicle on to the surface leaving a trail to identify the path of the vehicle at two locations on the vehicle. To achieve this we used the airless paint gun principle, where high pressure air drives the fluid at high velocity from the nozzle without mixing with the fluid. We positioned the spray nozzle near the in-board side of the tire approximately 1 inch from the roadway. The two nozzles were attached to the unsprung structure of the vehicle so that suspension deflections would not change the elevation or location of the nozzle end. The liquid (colored water) under high pressure contacted the roadway surface in milliseconds after leaving the nozzle end.

The location and small quantity of water paint on the roadway did not affect the roadway coefficient of friction. We installed two nozzles on each vehicle, one at the front and rear wheels to define the complete vehicle traectory. The operation of the trajectory marker was controlled by a solenoid

valve actuated by a contact switch before impact.

Crash Recorder - NHTSA

All vehicles except in Test 1 were equipped with a Teledyne Geotech Crash Recorder furnished by NHTSA. Table 3-2 lists the serial numbers of the crash recorder used in the vehicles on the respective tests. The recorders were installed under the front seat. Data from the on-board recorder can be correlated with the experimental test and the simulation results.

All recorders have been forwarded to NHTSA for their analysis.

Vehicle Data Reduction

The outputs from the transducers mounted on the vehicles are fed to signal conditioning and amplification equipment also mounted on-board. The amplified signals are then carried from the vehicles to remote recording station via a multi-channel umbilical cable and recorded on 14 channel FM tape recorders All the data recorded on this analogue tape is then converted to a digital output using a digital data reduction system. This system also has a number of software options which may be selected to obtain velocity and displacement by integration of the accelerations and to provide plots of all three parameters as a function of time. The measured accelerations (X,Y,Z) of each location were integrated to obtain velocity and displacement data. For the application of these data, See Section 1.0 in Volume IV of this document.

In addition to the time-history data from each transducer, the following crash test performance data was computer processed on selected channels and included in this report.

1. Vehicle Acceleration Time Histories
2. Vehicle Velocity Time Histories
3. Vehicle Displacement Time Histories
4. Triaxial Acceleration Resultant Time Histories
5. Vehicle Acceleration VS Displacements

TABLE 3-2

NHTSA ON-BOARD CRASH RECORDERS - Teledyne Geotech Model 35500

		Serial No.
Test No. 1 11/3/77	Car 1 Chevelle Car 2 Pinto	N.A. N.A.
Test No. 2 11/18/77	Car 1 Chevelle Car 2 Pinto	1312 1326
Test No. 3 4/18/78	Car 1 Torino Car 2 Pinto	1304 1349
Test No. 4 4/25/78	Car 1 Torino Car 2 Pinto	1268 1273
Test No. 5 4/10/78	Car 1 Torino Car 2 Honda	1628 1640
Test No. 6 5/22/78	Car 1 Chevelle Car 2 Rabbit	1310 1222
Test No. 7 5/31/78	Car 1 Chevelle Car 2 Rabbit	1674 1225
Test No. 8 6/15/78	Car 1 Honda Car 2 Chevelle	1264 1643
Test No. 9 6/20/78	Car 1 Honda Car 2 Torino	1210 1223
Test No. 10 6/23/78	Car 1 Honda Car 2 Torino	1233 1348
Test No. 11 7/7/78	Car 1 Torino Car 2 Vega	1280 1219
Test No. 12 7/12/78	Car 1 Torino Car 2 Vega	1229 1206
Spare		1224
Spare		1632

3.2 Photographic Coverage

Still Photographs

The following are typical pre-test photographs obtained using a standard press camera (4" x 5" negative) with black and white film.

1. Side view - both sides, both cars.
2. Front view - both cars.
3. Rear view - both cars.
4. Interior view to show dummy positioning (both sides).
5. On-board instrumentation packages.
6. Selected views of transducers.
7. Underside - both cars.
8. Overall test site viewed from camera tower.

Likewise, the following post-test photographs were obtained using a standard press camera (4" x 5" negative) with black and white film.

1. Side view - both sides, both cars.
2. Front view - both cars.
3. Rear view - both cars.
4. Right front three-quarter view - both cars.
5. Left front three-quarter view - both cars.
6. Right rear three-quarter view - both cars.
7. Left rear three-quarter view - both cars.
8. Interior view showing post-test dummy positions (both sides).
9. Underside - both cars.
10. Selected views showing details of vehicle damage
11. Overall test site viewed from camera tower showing vehicle positions.
12. Overall test site viewed perpendicular to test track showing vehicle positions.
13. Overall test site viewed parallel to test track showing vehicle positions.

High Speed Photography

A minimum of 10 high speed data cameras (16 mm) were used to photograph the event for each test. Cameras were stationed on the ground at eye level elevation and cameras were located on portable towers. All 16 mm data cameras used color film.

All high speed cameras were controlled by timing equipment in Calspan's photo-instrumentation control van. This control unit provides overall control of camera-event sychronization and time coding of film.

Vehicle impact time (time = 0) was established by a common photoflash which was recorded by all data cameras. The time zero event was actuated by a pressure contact switch positioned on the contact surface of one of the vehicles. This same event mark was coded electronically on all data recording equipment.

Since the spinout phase of the collision does not require the detailed analysis that the actual collision phase requires, i.e., the 1000 fps coverage is needed to adequately define the transient collision interface, the cameras filming the spinout ran at approximately 400 fps. Note that this is consistent with the usual practice in running the SMAC simulation program where a 5 ms time interval specified for the pre-collision and spinout phases is reduced to a 1 ms interval for the collision phase.

Documentary Photography

Two 16 mm motion picture cameras (24 fps) provided the following minimum coverage of the test.

- Pre-test vehicle conditions including instrumentation, dummy positions and vehicle details.
- Planning scenes, tracking vehicles before, during and after impact (one camera on each vehicle).
- Post-test vehicle conditions including damaged areas, dummy positions and special details of interest.

3.3 Dummies - Part 572

Two anthropomorphic Part 572 test dummies (50 percentile male) furnished by NHTSA were positioned in the front seat of both vehicles. For indications of dummy contact areas within the compartment, colored chalk was applied to the dummies using a different color for each dummy. The two dummies in the bullet car (V-1) were restrained with the vehicle-equipped seat belt systems and they were uninstrumented in this program except for Tests Nos. 11 and 12.

The establishment of occupant injury criteria data was not considered a major obective of this research program; therefore, fully instrumented Part 572 test dummies were only provided in the target vehicle (V-2). Except for the two front-to-front collisions (Test 11 & 12), all the dummies in the target vehicle (V-2) were unrestrained. All the occupant injury data measurements and on-board camera coverage were sponsored by the Occupant Packaging Branch of NHTSA, on a piggyback arrangement with the present program.

Dummy instrumentation included the following channels of data:

1.	Head Acceleration	-	XYZ
2.	Chest Acceleration	-	XYZ
3.	Pelvic Acceleration	-	Y
4.	Femur Loads	-	L & R

The direction of the dummy velocity vector within the vehicle during the collision is important in accident reconstruction. The basic dummy trajectories were documented with a minimum of two on-board data cameras in each target vehicle. The on-board cameras were mounted on the outside door panels with a special lightweight bracket, the rear deck behind the rear seat and on the roof. This on-board camera coverage recorded dummy kinematics, general seat belt and seat performance, and compartment interior areas associated with dummy contacts. The on-board cameras operate at a nominal 1,000 frames per second.

The vehicle interior (excluding glazing) was sprayed with a coat of white latex paint as a means to improve photographic coverage of the dummies. A coating of dyed chalk solution was applied to interior surfaces which are likely to be contacted by occupant head and chest segments. Such surfaces included the instrument panel, windshield header, lower dash panel (knee bar), and steering control. Some compartment interior lighting using long duration flash bulbs was provided to improve on-board photographic coverage. The dummies were thoroughly inspected after each crash and refurbished as necessary in accordance with standard procedures.

4.0 VEHICLE AND TEST SITE PREPARATION

The following vehicle and site preparations were completed before the vehicles were transported to the test site:

4.1 Vehicle Inspection

A receiving inspection of all test vehicles was performed to determine the status and condition of the following items.

- Exterior panels
- Frame and suspension structure
- Door hinges and latches
- Steering column and dash panel
- Glazing
- Steering control and linkages
- Brake system
- Fuel system components
- Seats and seat anchorages
- Restraint systems
- Fuel tanks were drained and half-filled with stoddard solvent to simulate on-board fuel.

The vehicle towing and guide rollers assembly were attached to a suitable structure under the front of the vehicle.

Each test vehicle was checked before conducting the test to demonstrate proper tracking (wheel alignment) of the vehicle when under tow.

4.2 Photographic Markings, Dimensions

Two spherical targets were mounted on the roof of each vehicle to aid analysis of the overhead film coverage; this technique has proven very successful where x, y and angular displacements are to be measured from a film analysis. Each vehicle had contrasting colors for ease of analysis and grids were placed on the vehicles using checkered tape of 1 inch gradations positioned to help delineate the collision interface between the two vehicles. Typical vehicle markings and targets for photographic analysis are shown in Figure 4-1.

4.3 Vehicle Test Weight

The test weight of each vehicle was obtained by placing vehicle scales under each wheel. The vehicle longitudinal center of gravity was calculated from these weights. All tires were inflated to manufacturer's specifications. Ride height and weight of each wheel was measured with all equipment and dummies on-board.

4.4 Vehicle Test Preparation

The following vehicle preparation items were performed on all test vehicles:

1. Drain fuel tank and add approximately one-half tank of water colored with red dye.
2. Drain radiator and battery and fill with water.
3. Drain all oil base liquids except power steering fluid.
4. Assure all original equipment and accessories remain in vehicle.
5. Install specified instrumentation.
6. Install specified on-board camera system including interior photographic lights.

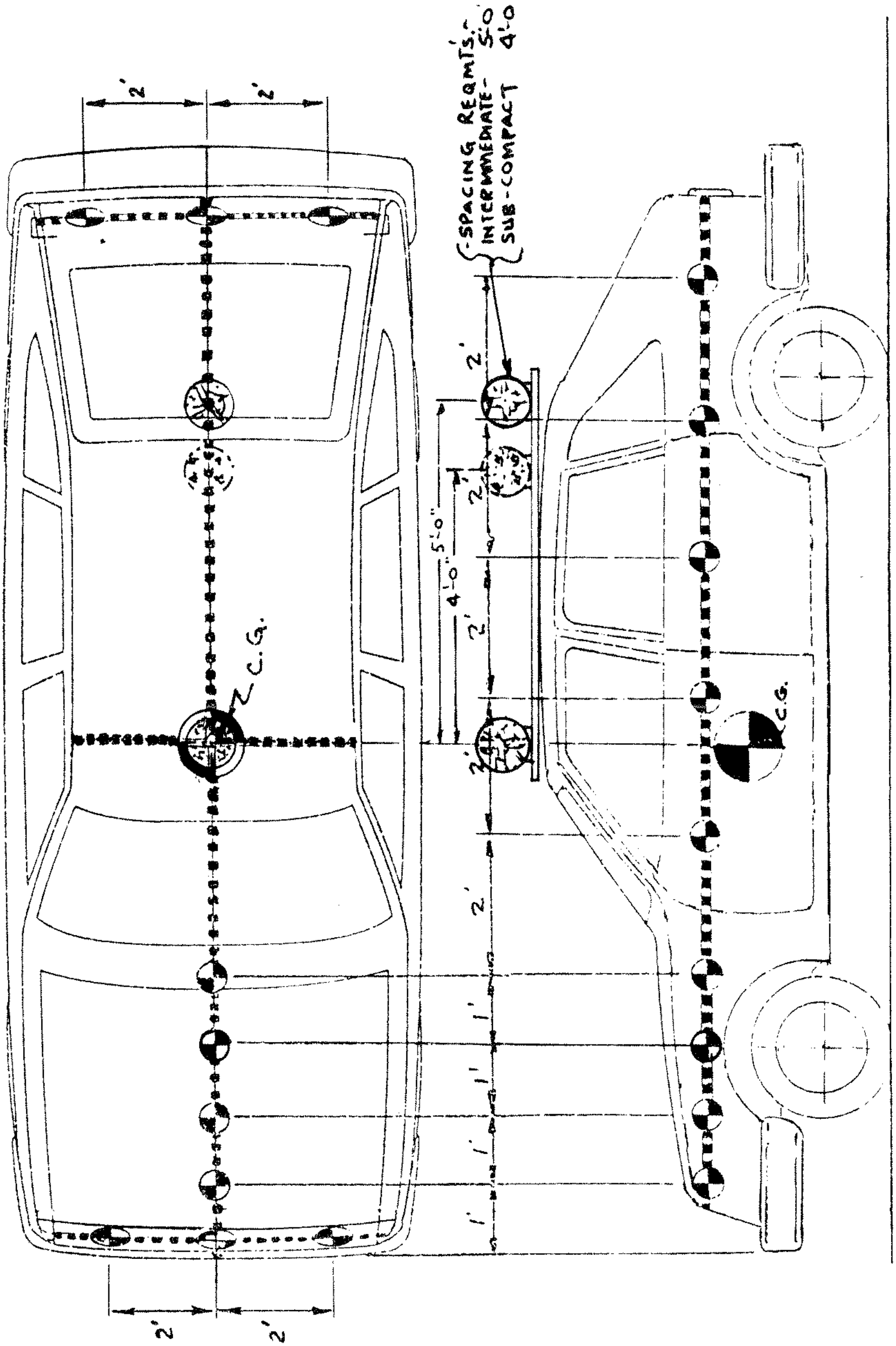


Figure 4-1 VEHICLE MARKINGS FOR PHOTOGRAPHY

7. Install on-board vehicle braking package.

8. Paint vehicle interior flat white for improved on-board photographic coverage.

9. Paint rotational marker on all four wheels.

10. Stencil test number and project identification number on both sides and roof of vehicle.

11. Secure vehicle photographic targets and checkered tape.

12. Install zero time impact flash system.

13. Position two dummies (Part 572, 50%) in the front seat and secure seat belt system per FMVSS No. 208 specifications when applicable.

14. Coat the steering wheel assembly, instrument panel, knee contact panel, windshield and door frame header with contrasting dyed chalk solution.

15. Inflate all tires to manufacturer's specified air pressure.

16. Install instrumentation and camera umbilical cable fixture.

17. Install towing and guidance hardware.

18. Weigh and ballast vehicle to the required weight after all equipment and dummies are on board.

19. Calculate vehicle center of gravity and c.g. targets.

20. Install spherical roof target fixture with the forward sphere on the vehicle c.g. station.

4.5 Test Site Preparation

The following test site preparation items were performed:

1. Layout and secure guidance rail system for specified collision configuration.

2. Locate and check pull cable pulleys required for specified collision.

3. Clean roadway surface at impact and spinout area.
4. Lay out Cable Tow System.
5. Position overhead camera towers and record location.
6. Locate ground camera stations and record location.
7. Locate stadium poles and ground markers and record location.
8. Secure pull cable release block for both vehicles.
9. Locate two timing clocks (50 msec/rev.) for maximum camera coverage.
10. Locate additional ground based zero time flash units for field of view by all data cameras.
11. Position speed trap for recording striking vehicle impact velocity.

4.6 Recording The Scene Data

To insure that each staged collision is documented thoroughly, the scene was investigated by Calspan's professional accident investigators. The following items were measured and the standard Collision Performance and Injury Report Form were completed by Calspan investigators.

1. Pre-impact skid marks or scuff marks for each wheel position - both vehicles.
2. At-impact position of each wheel - both vehicles.
3. Point of impact.
4. Final rest position of each wheel - both vehicles.
5. Gouges and scratches in the pavement surfaces.
6. Liquid spills and run-offs.
7. Debris, including directional dispersal.

8. Skid marks, scuff marks, etc.

9. Vehicle trajectory (paint trail).

The following scene data are presented in this final report for each test:

1. Accident schematic

2. Vehicle crush schematics L, C and D dimensions plus vehicle damage rating (CDC).

3. Scene and vehicle photographs (35 mm colored slides).
(Slides available under separate document.)

4. Occupant contact data.

5.0 Staged Collisions Test Data

All the experimental test data and supporting information for the twelve staged collisions is published in two volumes in this document. In addition, two copies of the edited 16 mm colored motion picture film coverage and 35 mm colored slides for each staged collision were transmitted to NHTSA to support the documentation of these experimental tests.

The following information and data for each staged collision is presented in this document:

- Test Description
- Accident Scene Schematic
- Test Data Summary
- Car No. 1 - Vehicle Data
- Car No. 1 - Vehicle Crush Data
- Car No. 1 - Occupant Contact Data

- Car No. 2 - Vehicle Data
- Car No. 2 - Vehicle Crush Data
- Car No. 2 - Occupant Contact Data
- Photographs - Pre- and Post Vehicle Exterior
- Photographs - Pre- and Post Vehicle Interior
- Car No. 1 - Vehicle Instrumentation Layout
- Car No. 2 - Vehicle Instrumentation Layout
- Vehicle Test Weights - Car No. 1 and Car No. 2
- Camera Site Location
- Camera Data Log
- Vehicle Wheel Response Data - Car No. 1 and Car No. 2
- Vehicle Attitude Data - Car No. 1 and Car No. 2
- Car No. 1 - Response Time Histories
  - Left Front Corner
  - Right Rear Corner
  - Firewall
  - Rear Deck
  - Front Bumper (X)
  - Acceleration XYZ Components
  - Velocity XYZ Components
  - Displacement XYZ Components
  - Acceleration Resultant
- Car No. 2 - Response Time Histories
  - Left Front Corner
  - Left Rear Corner
  - Firewall
  - Rear Deck

Right Front
- Right Front Door (Side Impact Only)
- Left Front Door (Side Impact Only)
- Acceleration XYZ Components
- Velocity XYZ Components
- Displacement XYZ Components
- Acceleration Resultant

- Dummy Injury Criteria Values - Driver and Front Passenger
- Dummy Response Time Histories - Driver and Front Passenger
  - Head Acceleration XYZ Components
  - Head Resultant
  - Head Severity Index
  - Chest Acceleration XYZ Components
  - Chest Resultant
  - Chest Velocity XYZ Components
  - Chest Displacement XYZ Components
  - Chest Severity Index
  - Femur Loads Left and Right
  - Pelvic Acceleration Y Component (Side Impact Only)
  - Pelvic Velocity
  - Pelvic Displacement

6.0 REFERENCES

1. McHenry, R. R., Lynch, J. P. and Segal, D. J., "Research Input for Computer Simulation of Automobile Collisions", Calspan Report No. ZQ-6057-V-3, June 1977.

2. McHenry, R. R., Baum, A. S., and Neff, D. O., "Yielding-Barrier Test Data Base - A Study of Side Impact Cases in the Multi-Disciplinary Accident Investigation (MDAI) File", Calspan Report No. ZR-5954-V-2, January 1977.

3. McHenry, R. R., and Miller, P. M., "Automobile Structural Crashwothiness", SAE Paper No. 700412, 1970 International Automobile Safety Conference Compendium, Detroit, Michigan, May 13-15, 1970.

TEST NO. 1

RICSAC STAGED COLLISION

FRONT-TO-SIDE

OBLIQUE - OFFSET

CHEVELLE/PINTO

VELOCITY 19.8 MPH

7.0 RICSAC STAGED COLLISION - TEST NO. 1

EXPERIMENTAL RESULTS

Test Description

This staged collision involved a 1974 Chevrolet Chevelle Malibu (V-1) striking a 1974 Ford Pinto (V-2) on the right side (front section) at an oblique angle of 60 degrees as shown in Figure 7-1. The impact velocity of both vehicles was 19.8 mph. The vehicle test weights were 4460 and 3110 pounds for the Chevelle and Pinto, respectively. Each vehicle had two Part 572 test dummies (50 percentile) seated in the front seat. The dummies in the Pinto were instrumented according to FMVSS 208 and were unrestrained. In the Chevelle the dummies were uninstrumented and were restrained with seat belts.

The Chevelle was equipped with automatic transmission, power steering and power brakes. The Pinto had manual transmission, steering and standard brakes. The accident was staged with both transmissions in drive position, brakes off and the engines not running. During the collision no steering control inputs or vehicle braking was applied. The roadway was dry with skid resistance value of 87.

Approximately one car length before impact the vehicle tow cable was released and the vehicle guide rail was terminated. At this point in time and during the collision both vehicles are free bodies with no constraints except the normal collision forces and reactions encountered in this type of car-to-car collision. During the collision event no observed tow cable or instrumentation cable interference with the moving vehicles was noted.

ACCIDENT SCHEMATIC

VEHICLES:

No. 1 - 1974 CHEVROLET CHEVELLE MALIBU
No. 2 - 1974 FORD PINTO

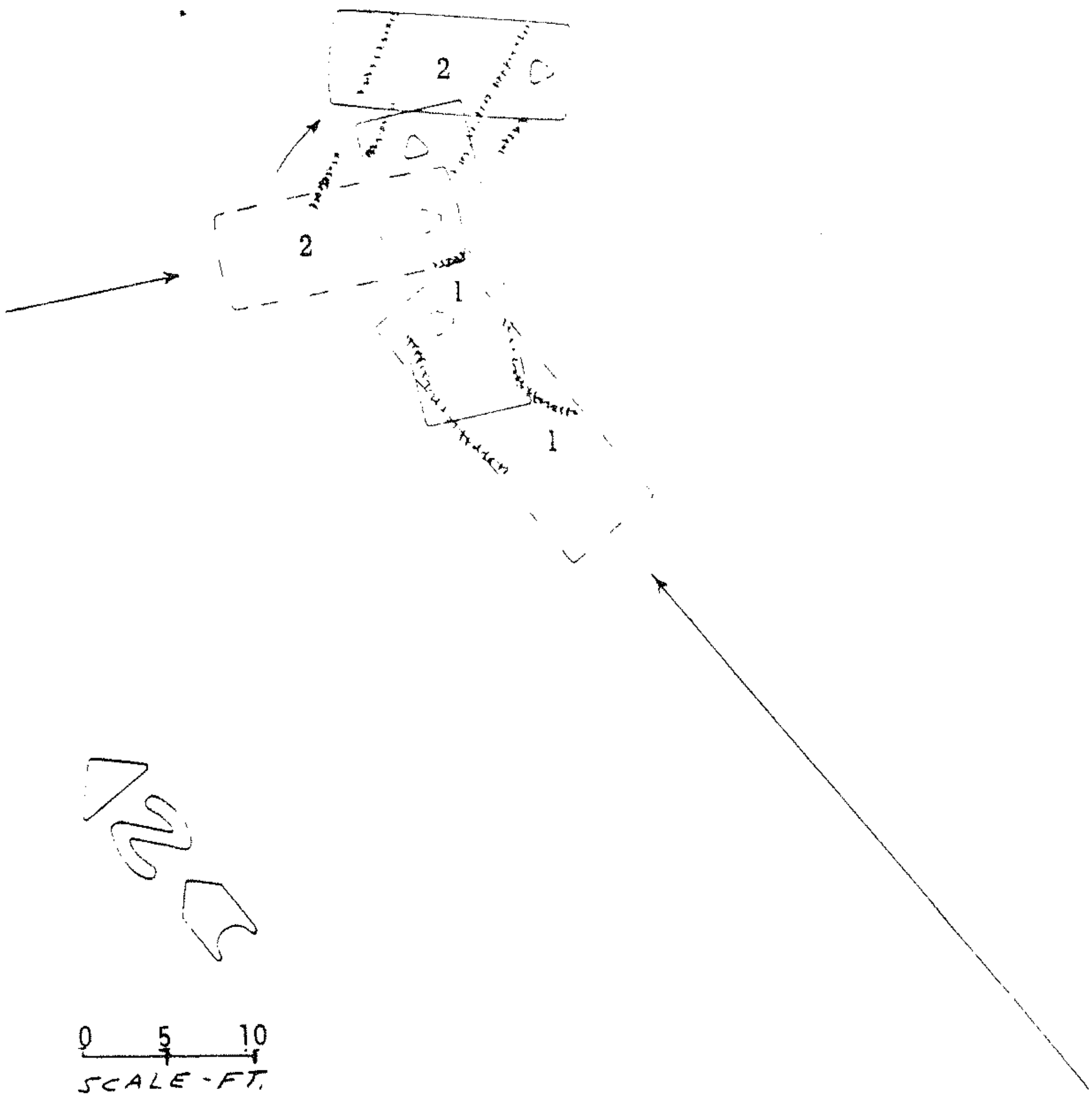


Figure 7-1. TEST NO. 1 - RICSAC ACCIDENT SCHEMATIC

CRASH TEST SUMMARY

TEST NO. 1

PROJECT RICSAC

DATE 11-3-77

TIME 15:32

TEMP. 71° F

TEST CONDITION Car to Car, Side Oblique Offset

VEHICLE NO. 1 1974 Chevrolet Chevelle

VEHICLE NO. 2 1974 Ford Pinto

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	4650	3110
IMPACT ANGLE (deg)*	120	0
IMPACT VELOCITY (mph)**	19.85	19.85
MAX. CRUSH (in)	14.8	12
MAX. INTRUSION (in)	-	-

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Part 572, Hybrid II	Part 572, Hybrid II
LOCATION	Driver (LF), Passenger (RF)	Driver (LF), Passenger (RF)
RESTRAINT	3-Point System	Unrestrained Dummies

NUMBER OF DATA CHANNELS 60

NUMBER OF HIGH SPEED CAMERAS 9

*WITH RESPECT TO TOW TRACK CENTERLINE

**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

TEAM	YEAR	MONTH	DAY	SEQUENCE
	7	1 1	0 3	

TABLE 7-1
TEST NO. 1 - CAR NO. 1
VEHICLE DATA

Vehicle data not collected. Reason?

Vehicle No. 1   14-15 No. of VIN Characters 1 3

16-22 VIN (Left Justify, Omit Production Numbers) 1 C 2 9 H 4 1

3-27 Make/Model (CPIR Code) CHEVROLET CHEVELLE MALIBU

3-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more
99999 = Unknown

33-34 Model Year 7 4

-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01 4 DR	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 0 3, 8 0 5

-42 Occupant and Cargo Only __ __, __ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 1	1 1 F Z E W 2	2	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ______	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

'77   1

Figure 7-2

VEHICLE CRUSH SCHEMATIC

TEST NO. 1 - CAR NO. 1

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 2

LF 2

RR 2

LR 2

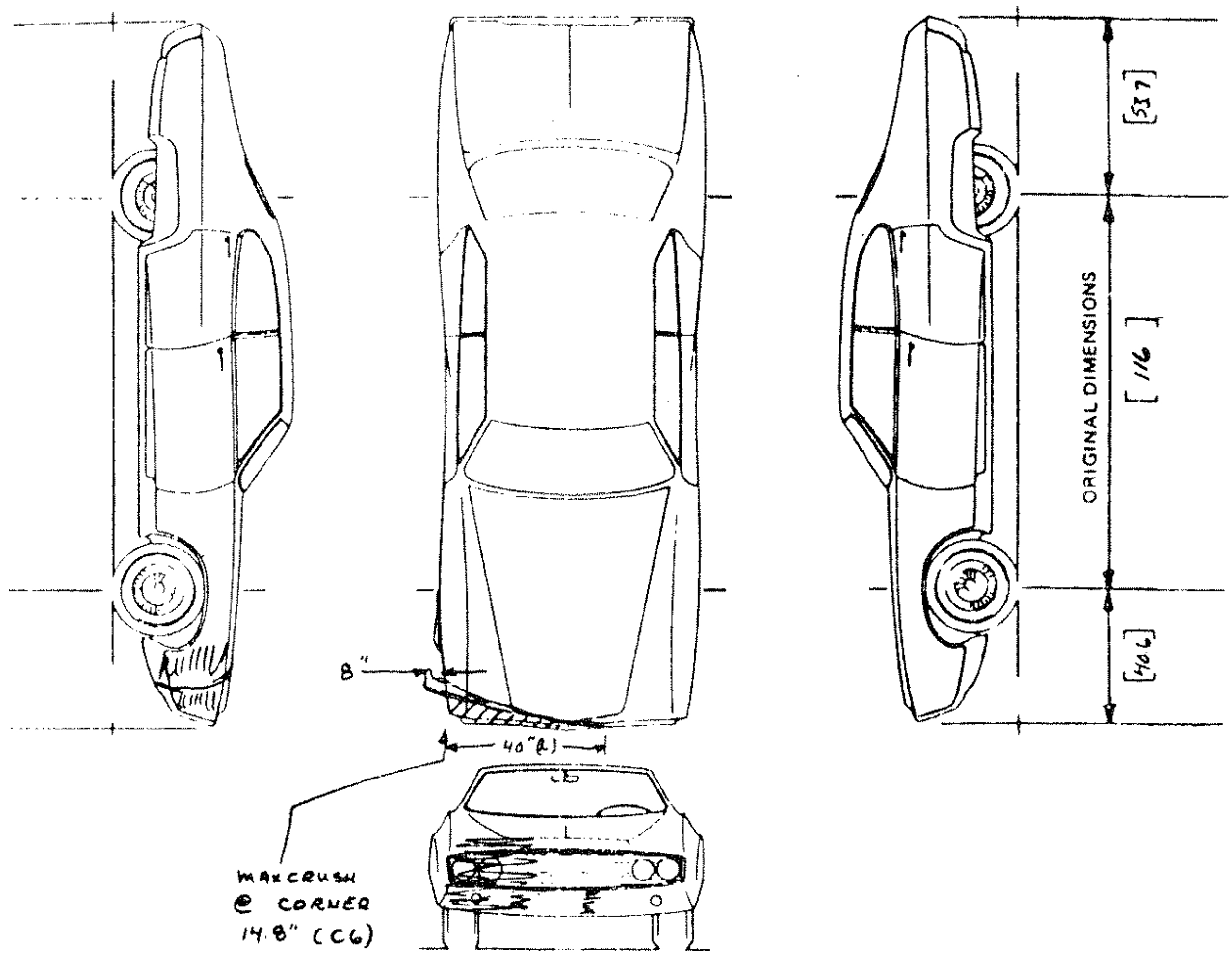
1 Yes, 2 No, 8 NA, 9 Unk.

WHEEL STEER ANGLES*

(For locked front wheels or displaced rear axles only)

RF
LF
RR
LR

Within ± 5°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	46"	4"	5.5"	7"	10.2"	12.1"	14.8"	+14.3"
2								
3								
4								

NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

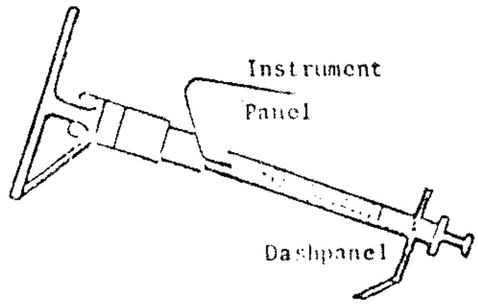
Figure 7-3

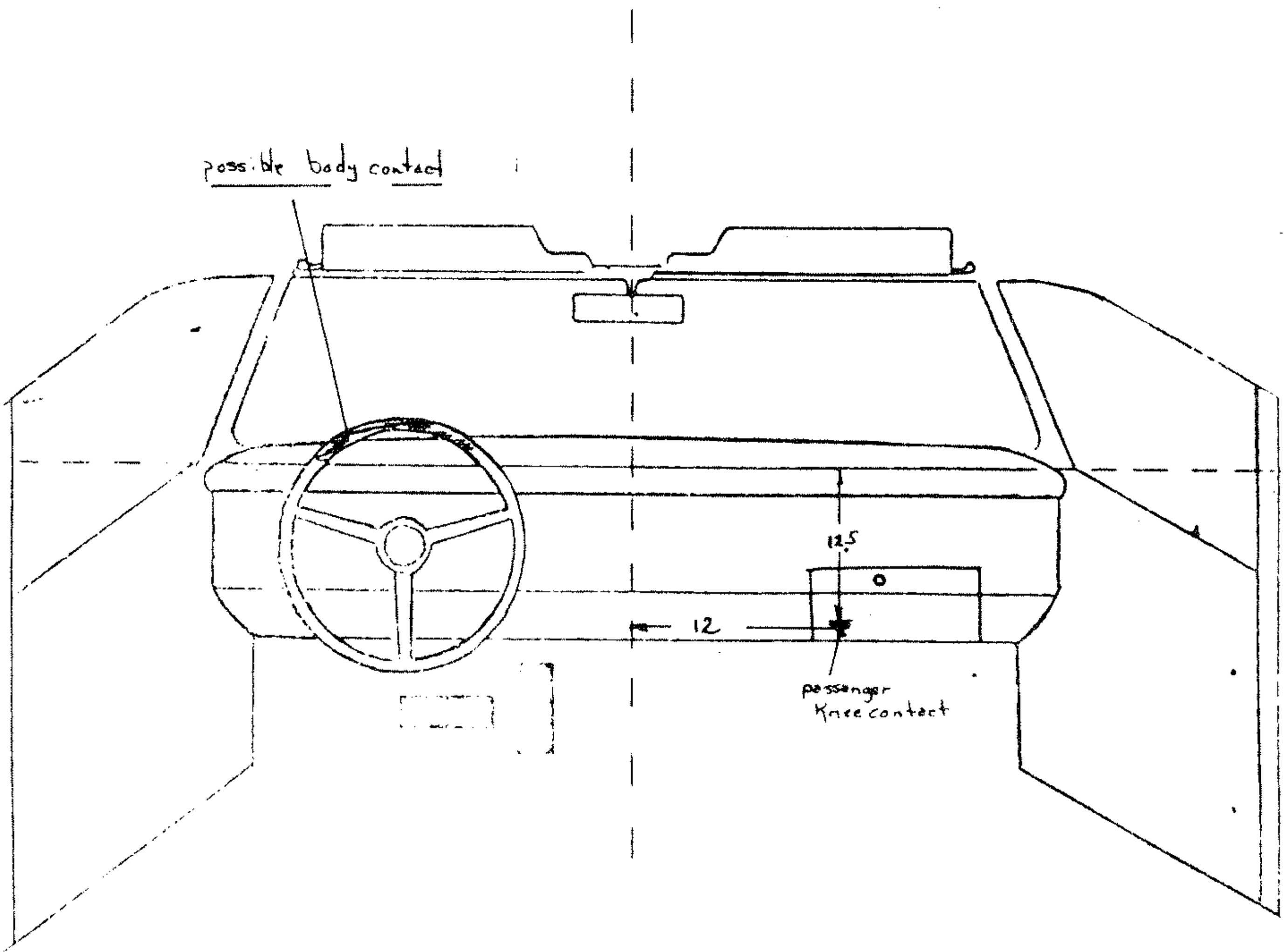
OCCUPANT CONTACT DATA
TEST NO. 1 - CAR NO. 1

VEHICLE INTERIOR

CHEVELLE

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

TABLE 7-2

TEST NO. 1 - CAR NO. 2

VEHICLE DATA

TEAM	YEAR	MONTH	DAY	SEQUENCE
__	7	1 1	0 3	__ __

Vehicle data not collected. Reason? ______

Vehicle No. 2 . — 14-15 No. of VIN Characters 1 1

16-22 VIN (Left Justify, Omit Production Numbers) 4 T 1 0 X 2 2

23-27 Make/Model (CPIR Code) FORD PINTO

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more
99999 = Unknown

33-34 Model Year 7 4

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 0 2, 4 4 3

40-42 Occupant and Cargo Only __ __, __ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 3	0 1 R D E W 3	1	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated AV

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ______	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

2/77

ZQ-6057-V-4

VEHICLE CRUSH SCHEMATIC

TEST NO. 1 - CAR NO. 2

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

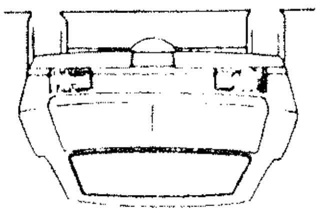
RF 2

LF 2

RR 2

LR 2

1 Yes, 2 No, 8 NA, 9 Unk.



WHEEL STEER ANGLES*

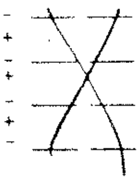
(For locked front wheels or displaced rear axles only)

RF +/-

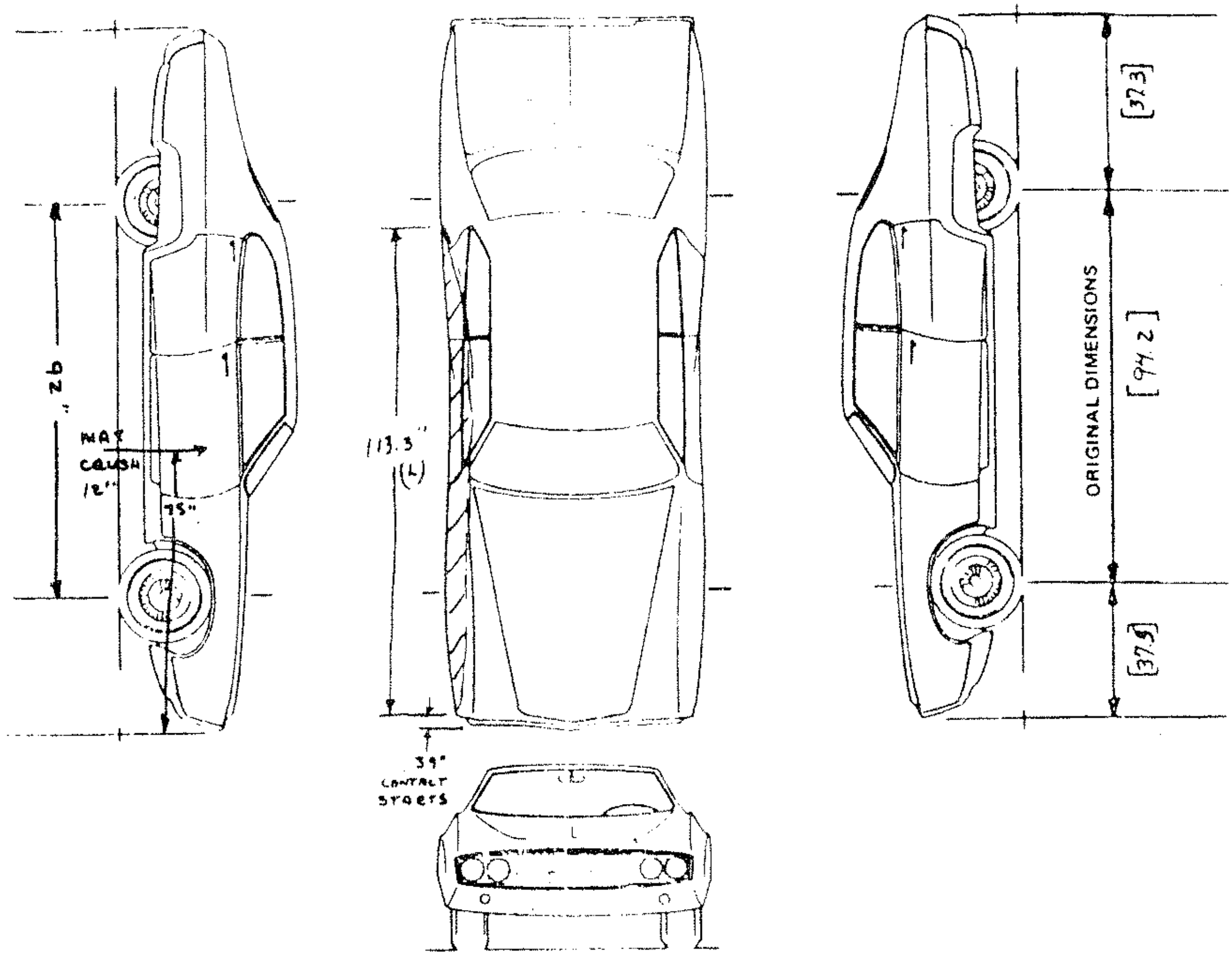
LF +/-

RR +/-

LR +/-



Within ± 5°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	113.3	0.5	12	10.6	11.8	9	4.1	+21.8
2								
3								
4								

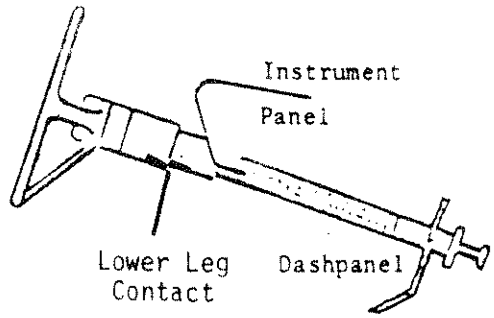
NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

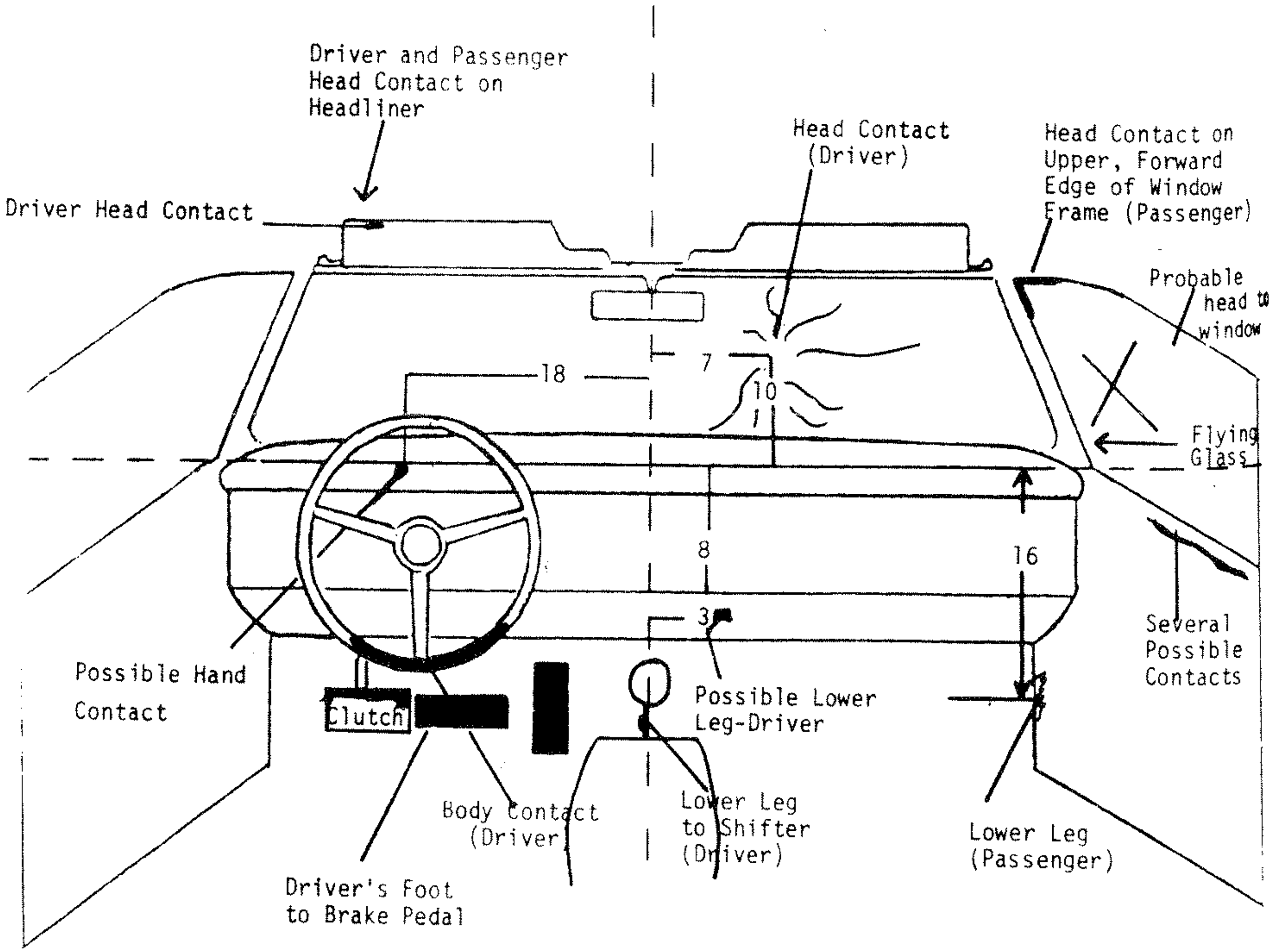
OCCUPANT CONTACT DATA
TEST NO. 1 - CAR NO. 2

VEHICLE INTERIOR

PINTO

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

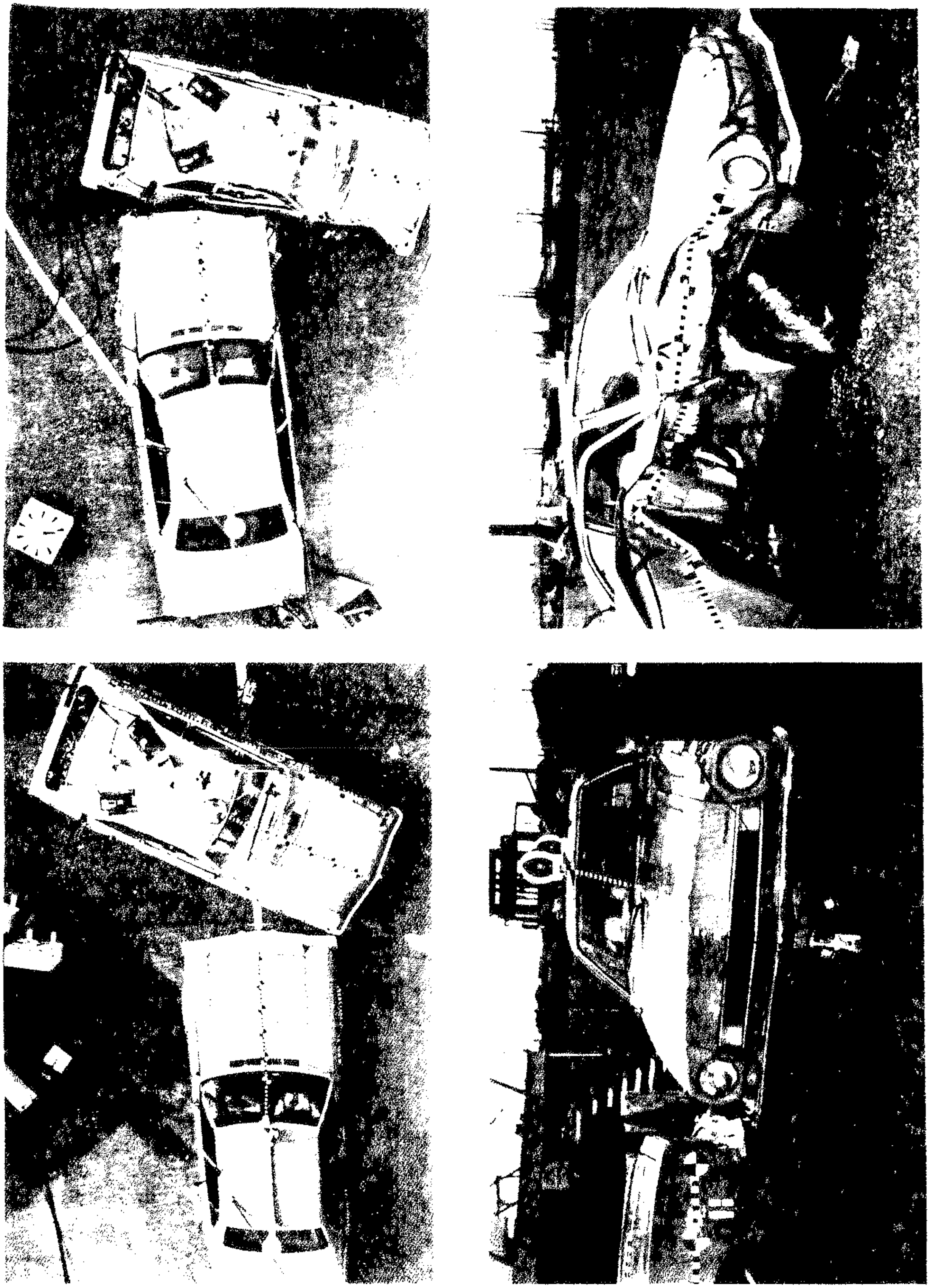


Figure 7-6 TEST NO. 1 — PRE AND POST COLLISION SCENE

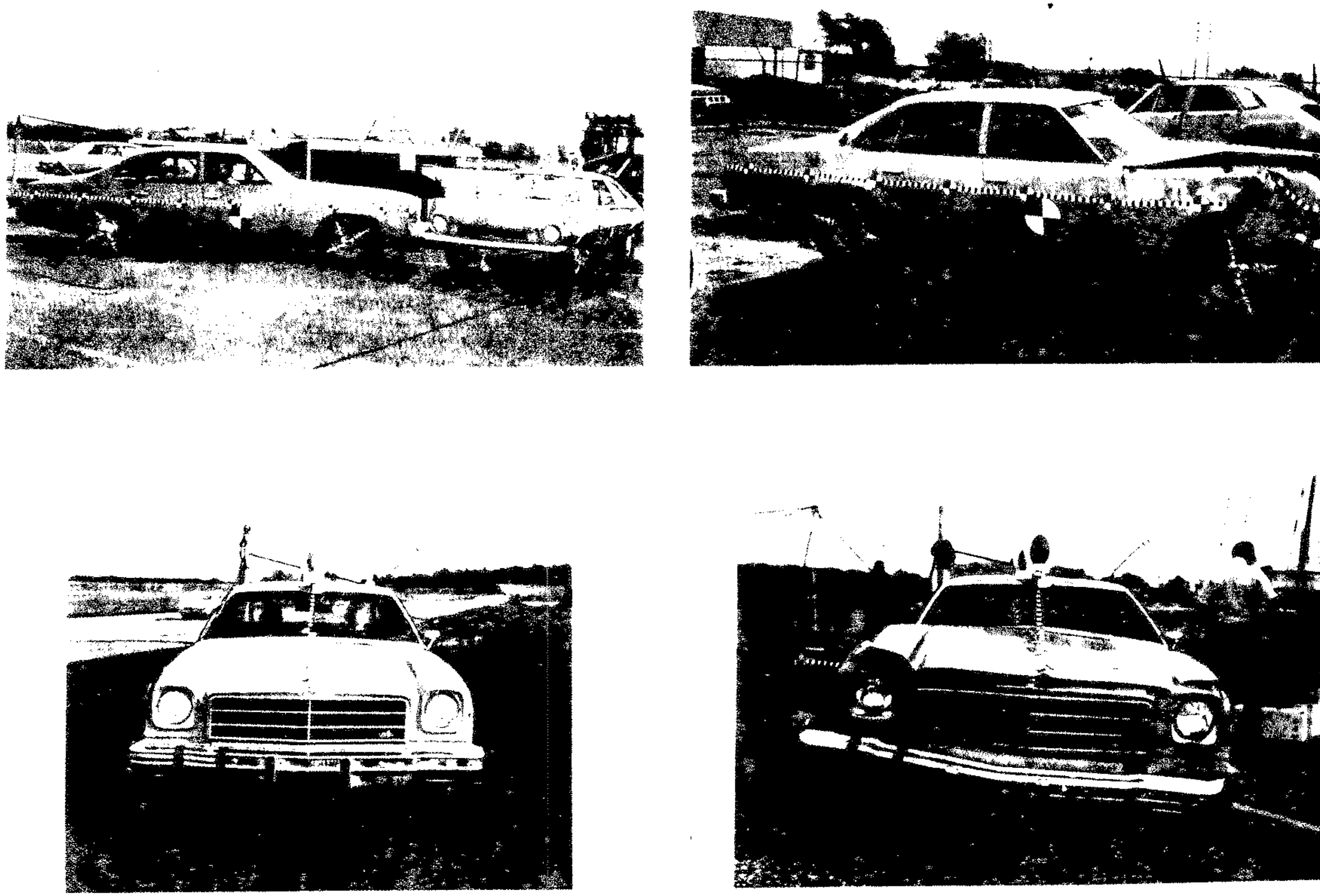


Figure 7-7 TEST NO. 1 -- PRE AND POST EXTERIOR VIEWS, CAR NO. 1 CHEVELLE

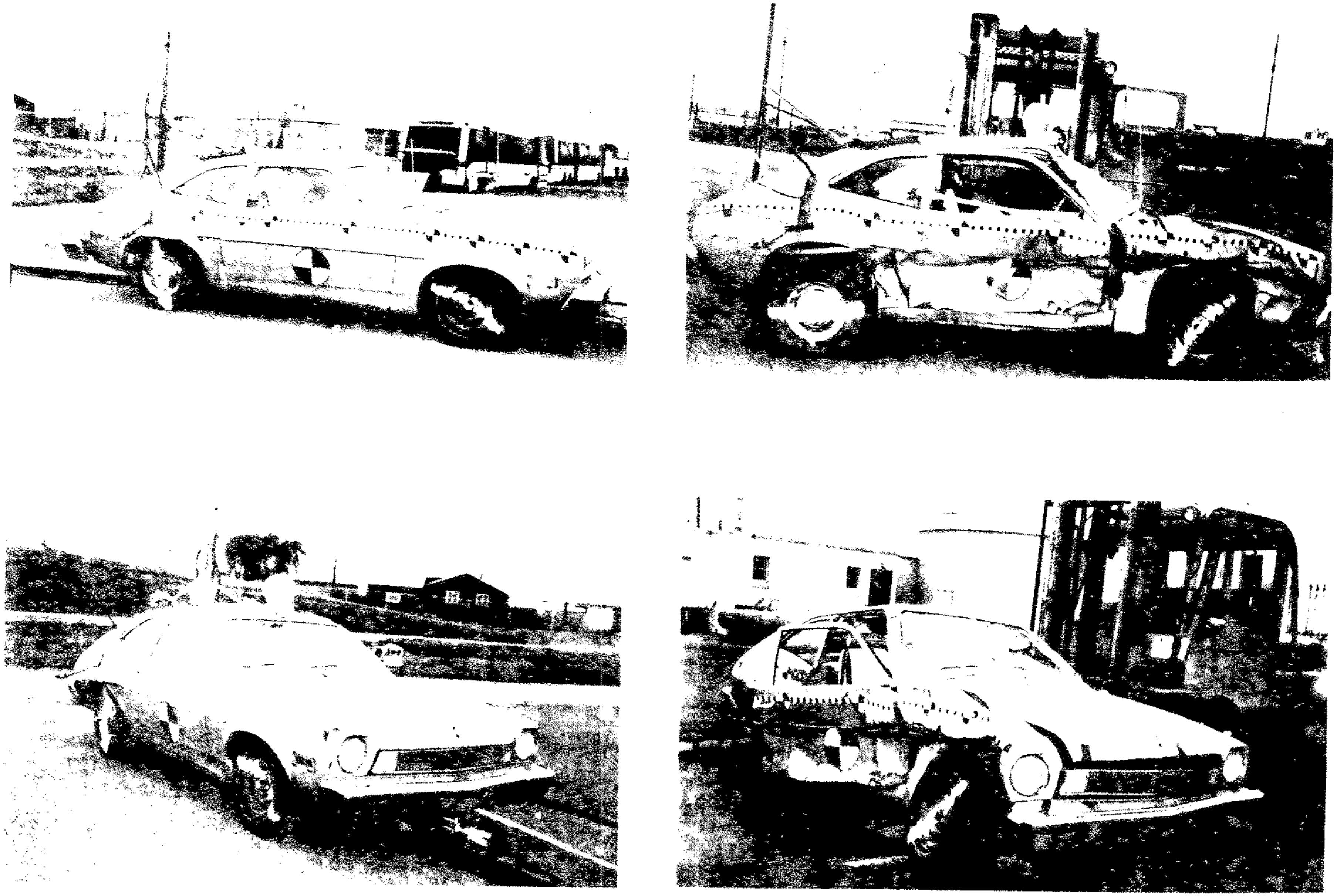


Figure 7-8 TEST NO. 1 – PRE AND POST EXTERIOR VIEWS, CAR NO. 2 · PINTO

Figure 7-9 TEST NO. 1 — PRE AND POST INTERIOR VIEWS, CAR NO. 1 - CHEVELLE

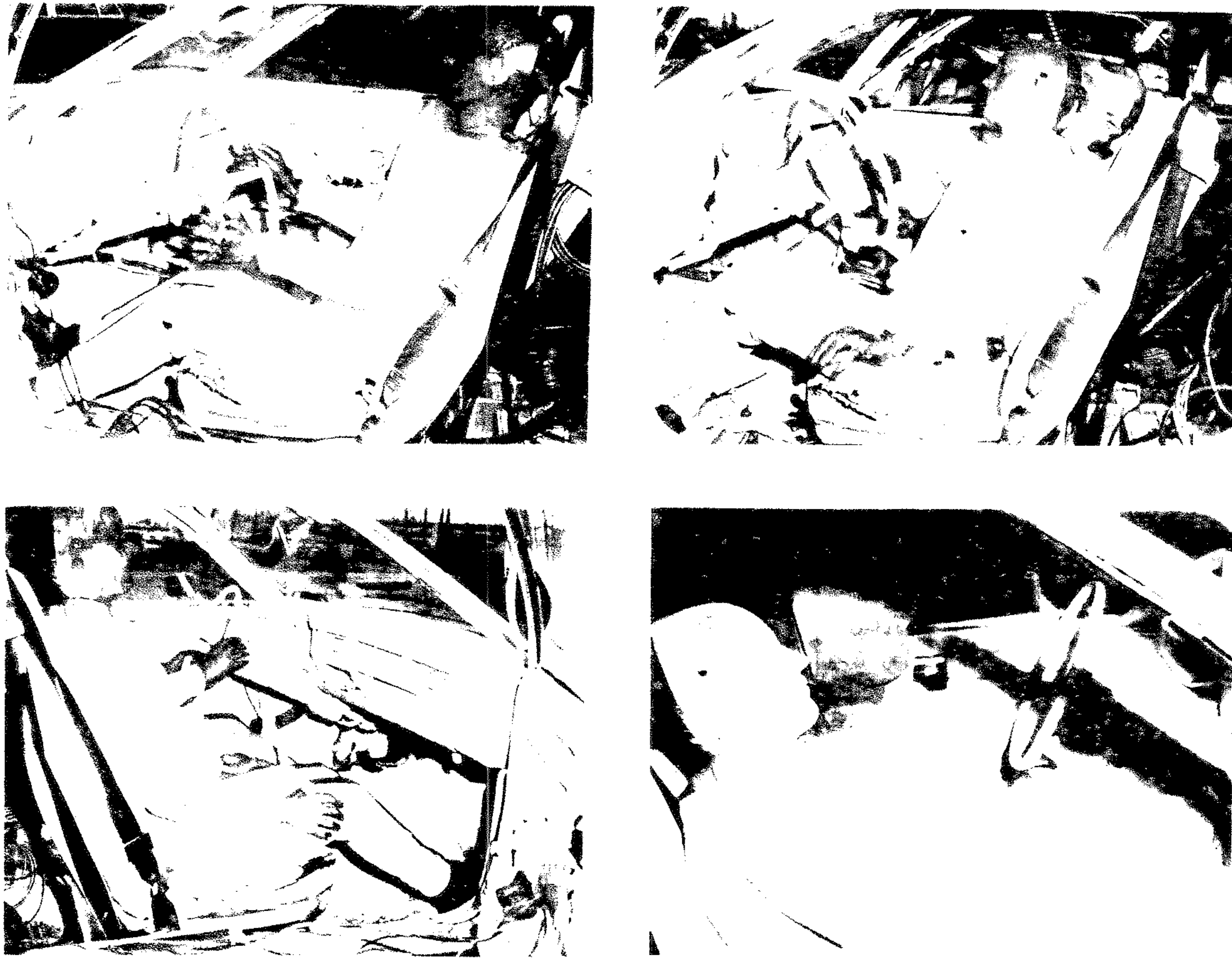


Figure 7-10 TEST NO. 1 — PRE AND POST INTERIOR VIEWS, CAR NO. 2 - PINTO

TABLE 7-3

ELECTRONIC INSTRUMENTATION TEST No. 1

CAR NO. 1 - CHEVELLE

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS *
VEHICLE ACCELEROMETER			
1	X,Y,Z	Left Sill Next to Front Seat	L.F. Corner
2	X,Y,Z	Right Sill Next to Rear Seat	R.R. Corner
3	X,Y,Z	Deck Over Rear Axle	Rear Deck
4	X,Y,Z	Firewall	Firewall
5	X	Front Bumper	Bumper
VEHICLE GYROS			
Pitch Angle - 6	Q	On Centerline of Trunk Comp.	Pitch Angle
Roll Angle - 6	P	On Centerline of Trunk Comp.	Roll Angle
Yaw Angle - 6	R	On Centerline of Trunk Comp.	Yaw Angle
Yaw Rate - 6	$\dot{R}$	On Centerline of Trunk Comp.	Yaw Rate
MISCELLANEOUS			
L.F. Wheel Velocity	$\dot{X}$	L.F. Wheel	L.F. Wheel Velocity
R.R. Wheel Velocity	$\dot{X}$	R.R. Wheel	R.R. Wheel Velocity
L.R. Wheel Velocity	$\dot{X}$	L.R. Wheel	L.R. Wheel Velocity
Steer Angle	θ	Front Wheel Steering Linkage	Steer Angle

* See Accelerometer Layout Diagram Figure 7-11

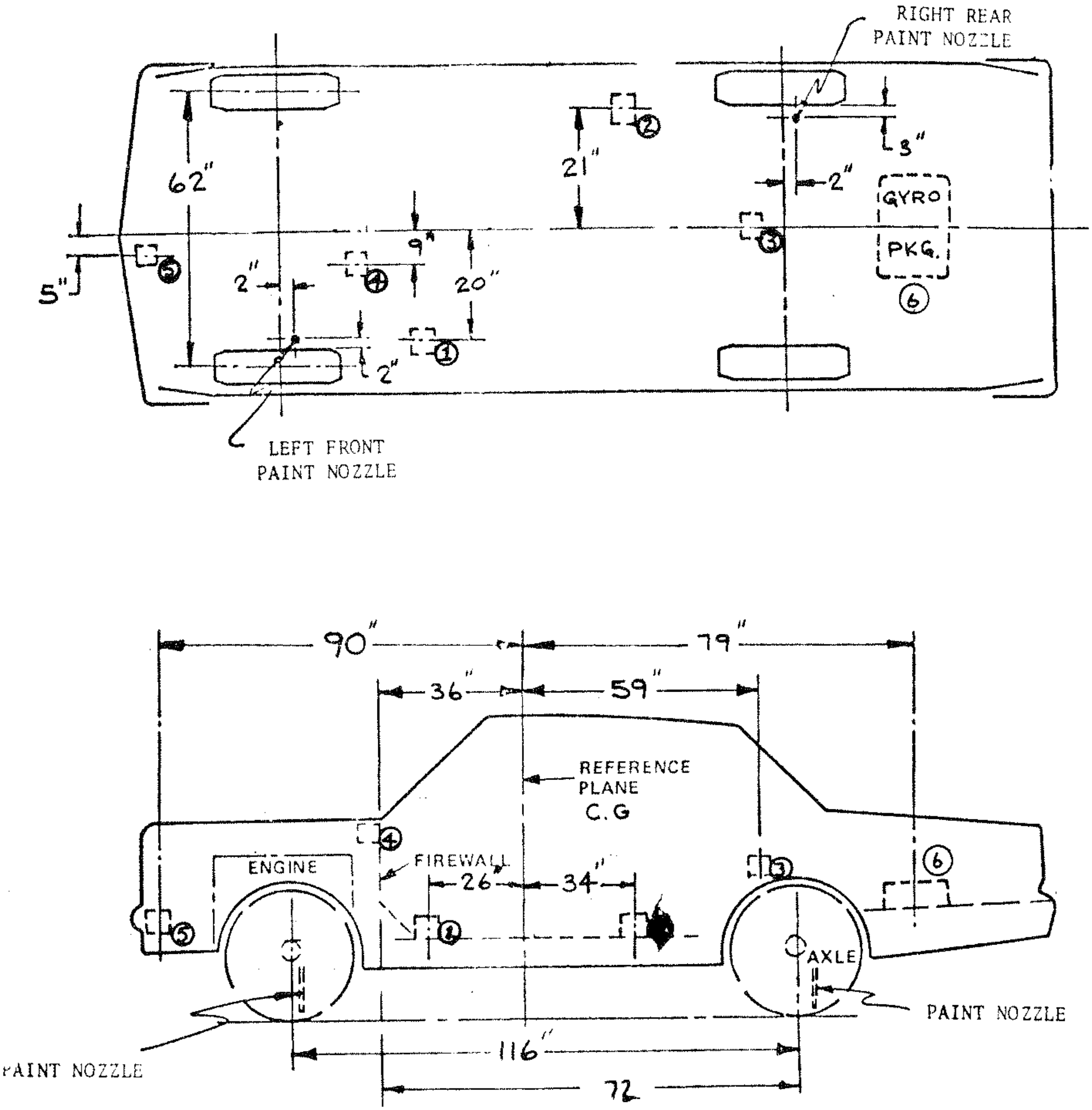


Figure 7-11 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 1 - 1974 CHEVELLE - TEST NO. 1

Table TABLE 7-4

ELECTRONIC INSTRUMENTATION TEST No. 1

CAR NO. 2 - PINTO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Left Sill Next to Front Seat	L.F. Corner
2	X,Y,Z	Left Sill Next to Rear Sear	L.R. Corner
3	Y	Left Front Door	L.F. Door
4	Y	Right Front Door (Upper)	Upper Right Front Door
5	Y	Right Front Door (lower)	Lower Right Front Door
6	X,Y,Z	Firewall	Firewall
7	X,Y,Z	Rear Deck Over Rear Axle	Rear Deck
VEHICLE GYRO			
Pitch Angle - 8	Q	On Centerline of Trunk Comp.	Pitch Angle
Roll Angle - 8	P	On Centerline of Trunk Comp.	Roll Angle
Yaw Angle - 8	R	On Centerline of Trunk Comp.	Yaw Angle
Yaw Rate - 8	$\dot{R}$	On Centerline of Trunk Comp.	Yaw Rate
MISCELLANEOUS			
L.F. Wheel Velocity	$\dot{X}$	L. F. Wheel	L.F. Wheel Velocity
R.R. Wheel Velocity	$\dot{X}$	R. R. Wheel	R.R. Wheel Velocity
L.R. Wheel Velocity	$\dot{X}$	L. R. Wheel	L.R. Wheel Velocity
Steer Angle	θ	Front Wheel Steering Linkage	Steer Angle
DUMMY			
L.F. Head	X,Y,Z	L.F. Seat	Dummy (LF) Head
L.F. Chest	X,Y,Z	L.F. Seat	Dummy (LF) Chest
L.F. Pelvic	Y	L.F. Seat	Dummy (LF) Pelvic
L.F. Femurs	R,L**	L.F. Seat	Dummy (LF) Femurs
R.F. Head	X,Y,Z	R.F. Seat	Dummy (RF) Head
R.F. Chest	X,Y,Z	R.F. Seat	Dummy (RF) Chest
R.F. Pelvic	Y	R.F. Seat	Dummy (R.F.) Pelvic
R.F. Femurs	R,L**	R.F. Seat	Dummy (" ") Femurs

*SEE ACCELEROMETER LAYOUT DIAGRAM FIGURE 7-12

**RIGHT & LEFT FEMUR FORCES

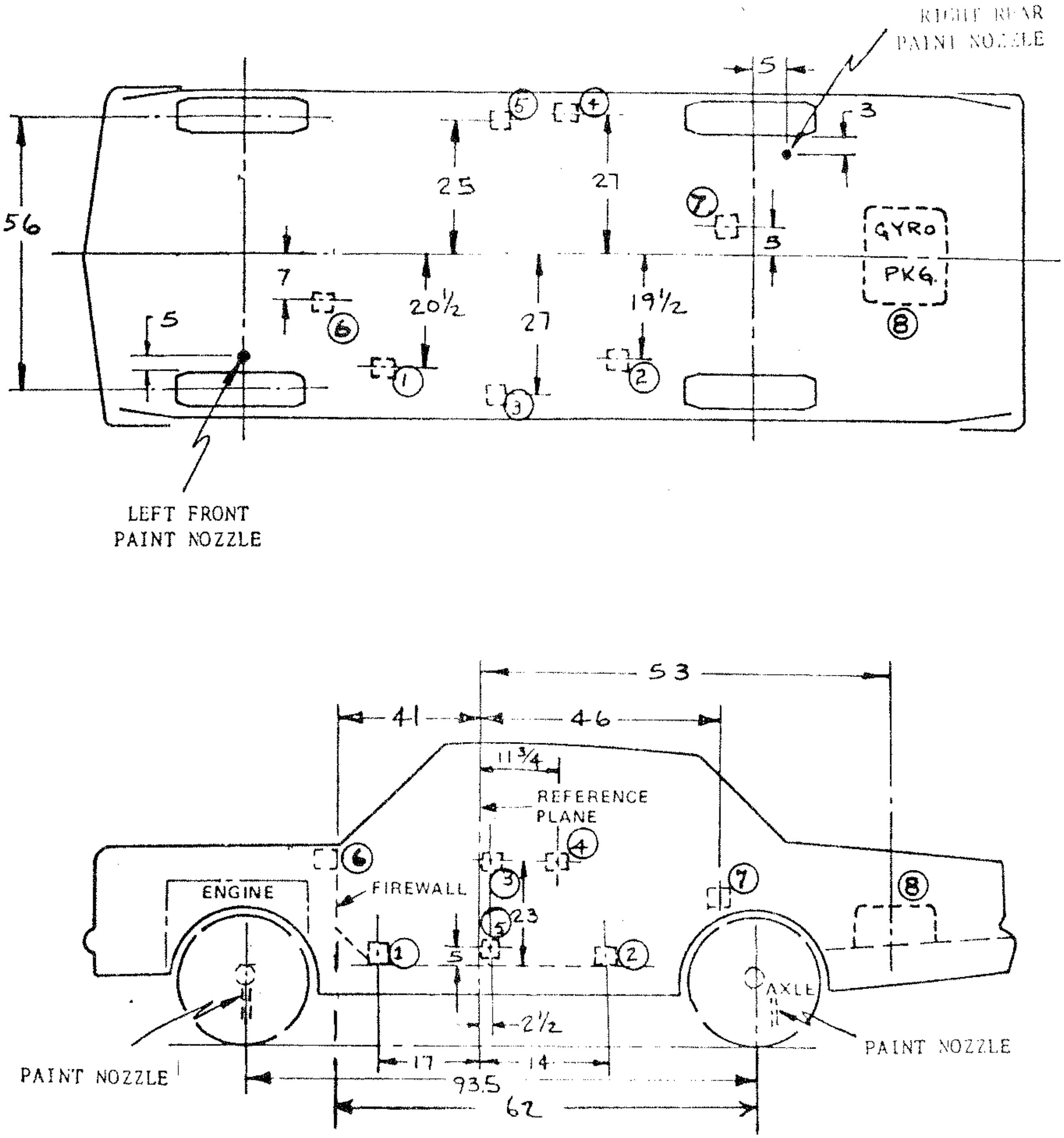


Figure 7-12 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 2 - 1974 FORD PINTO - TEST NO. 1

TABLE 7-5

VEHICLE TEST WEIGHTS - TEST NO. 1

BULLET VEHICLE

CAR 1 - 1974 CHEVROLET CHEVELLE

Left Front	1290 lbs.	Left Rear	1040 lbs.
Right Front	1320 lbs.	Right Rear	1000 lbs.
Total Front	2610 lbs.	Total Rear	2040 lbs.

Total Weight = 2610 lbs. + 2040 lbs. = 4650 lbs.

Wheel Base 116 in.

Cg_{FW} = $\frac{2040 \text{ lbs.}}{4650 \text{ lbs.}}$ 116 in. = 50.89 in.

TARGET VEHICLE

CAR 2 - 1974 FORD PINTO

Left Front	810 lbs.	Left Rear	790 lbs.
Right Front	780 lbs.	Right Rear	730 lbs.
Total Front	1590 lbs.	Total Rear	1520 lbs.

Total Weight = 1590 lbs. + 1520 lbs. = 3110 lbs.

Wheel Base 93.5 in.

Cg_{FW} = $\frac{1520 \text{ lbs.}}{3110 \text{ lbs.}}$ 93.5 in. = 45.69 in.

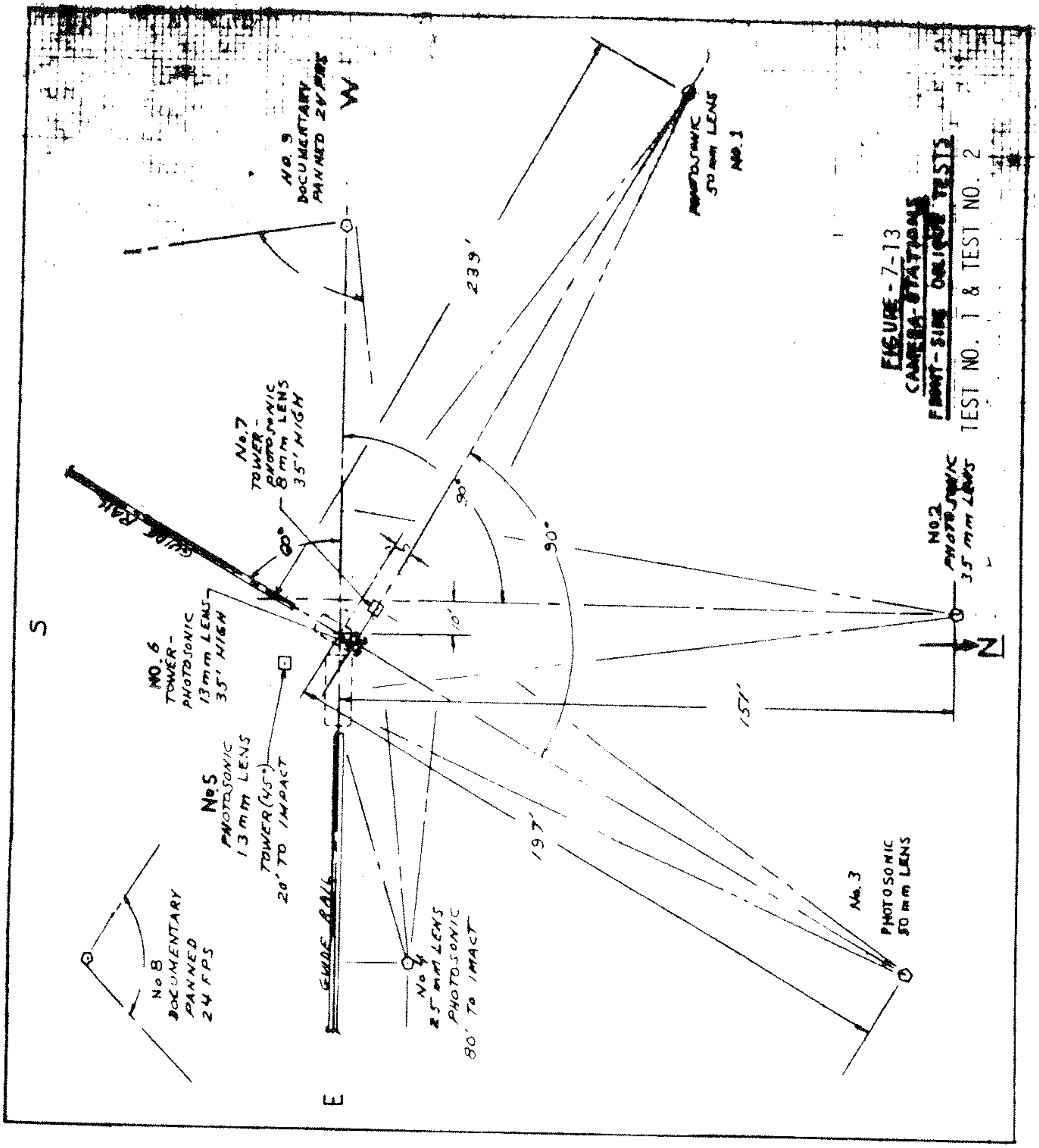


FIGURE - 7-13
CAMERA STATIONS
FRONT-SIDE OBLIQUE TESTS
TEST NO. 1 & TEST NO. 2

TABLE 7-6

DATA CAMERA LOG

PROJECT - RICSAC

TEST NO. 1

DATE: November 3, 1977

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
3	NORTH	PHOTOSONIC	50 MM	550
2	NORTHWEST	PHOTOSONIC	35 MM	500
1	WEST	PHOTOSONIC	50 MM	400
4	NORTHEAST	PHOTOSONIC	25 MM	500
5	TOWER 45	PHOTOSONIC	13 MM	400
6	TOWER CLOSE	PHOTOSONIC	13 MM	300
7	TOWER WIDE	PHOTOSONIC	8 MM	500
8	O. B. ROOF PASS.	STALEX	8 MM	1000
9	O. B. ROOF DRIVER	STALEX	8 MM	800

NOTE:
1. CAMERAS ARE LISTED ACCORDING TO SPLICING SEQUENCE OF FILM.
2. REAL TIME MOVIE FILM COVERAGE OF PRE- AND POST-CRASH AND CRASH EVENT ARE SPLICED AT START AND END OF FILM (24 fps).
3. FOR CAMERA LOCATIONS AND DISTANCE TO SUBJECT SEE FIGURE

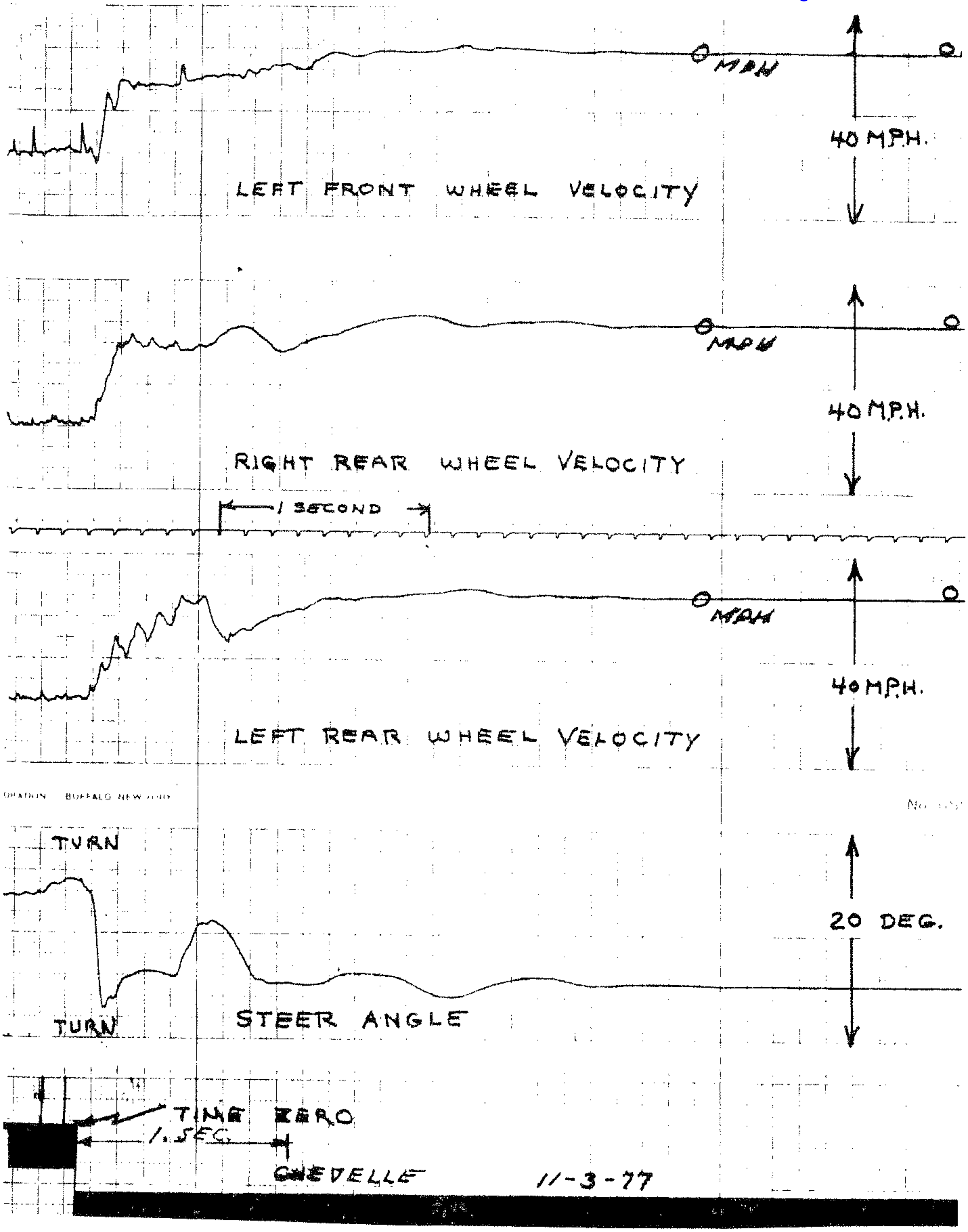


Figure 7-14 TEST NO. 1
CAR NO. 1 WHEEL RESPONSES

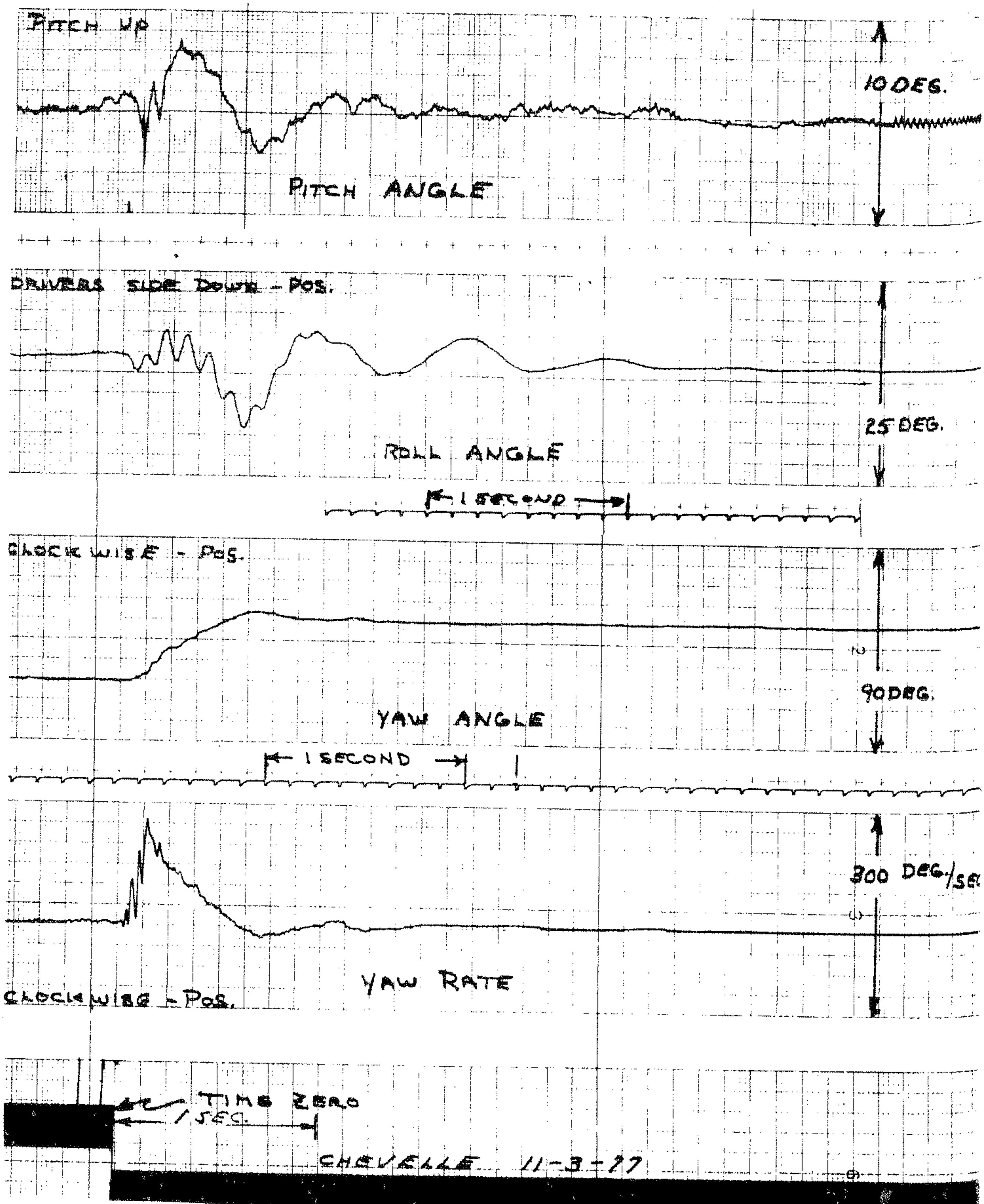


Figure 7-15 TEST NO. 1

CAR NO. 1 VEHICLE ATTITUDE

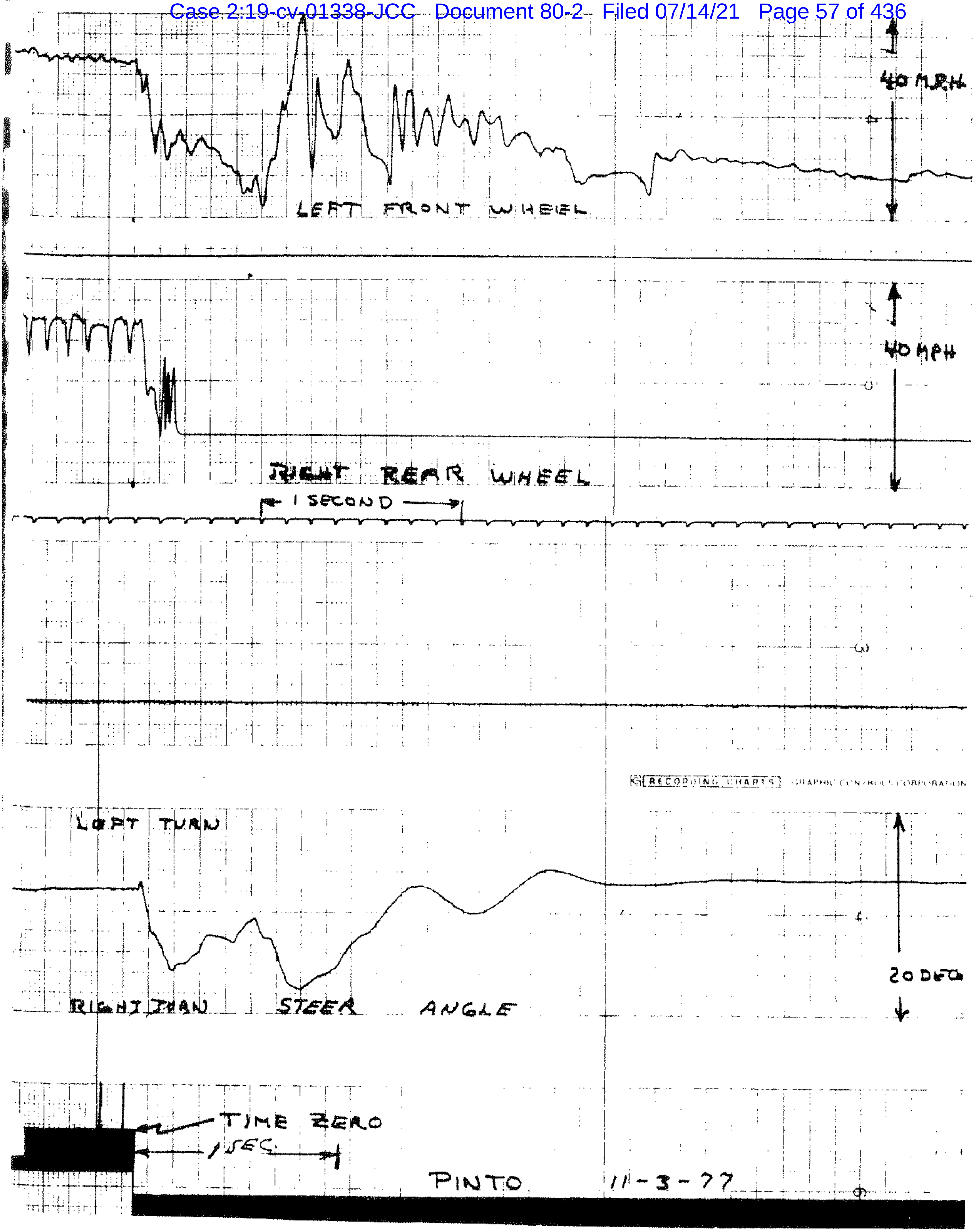


Figure 7-16 TEST NO. 1
CAR NO. 2 WHEEL RESPONSES

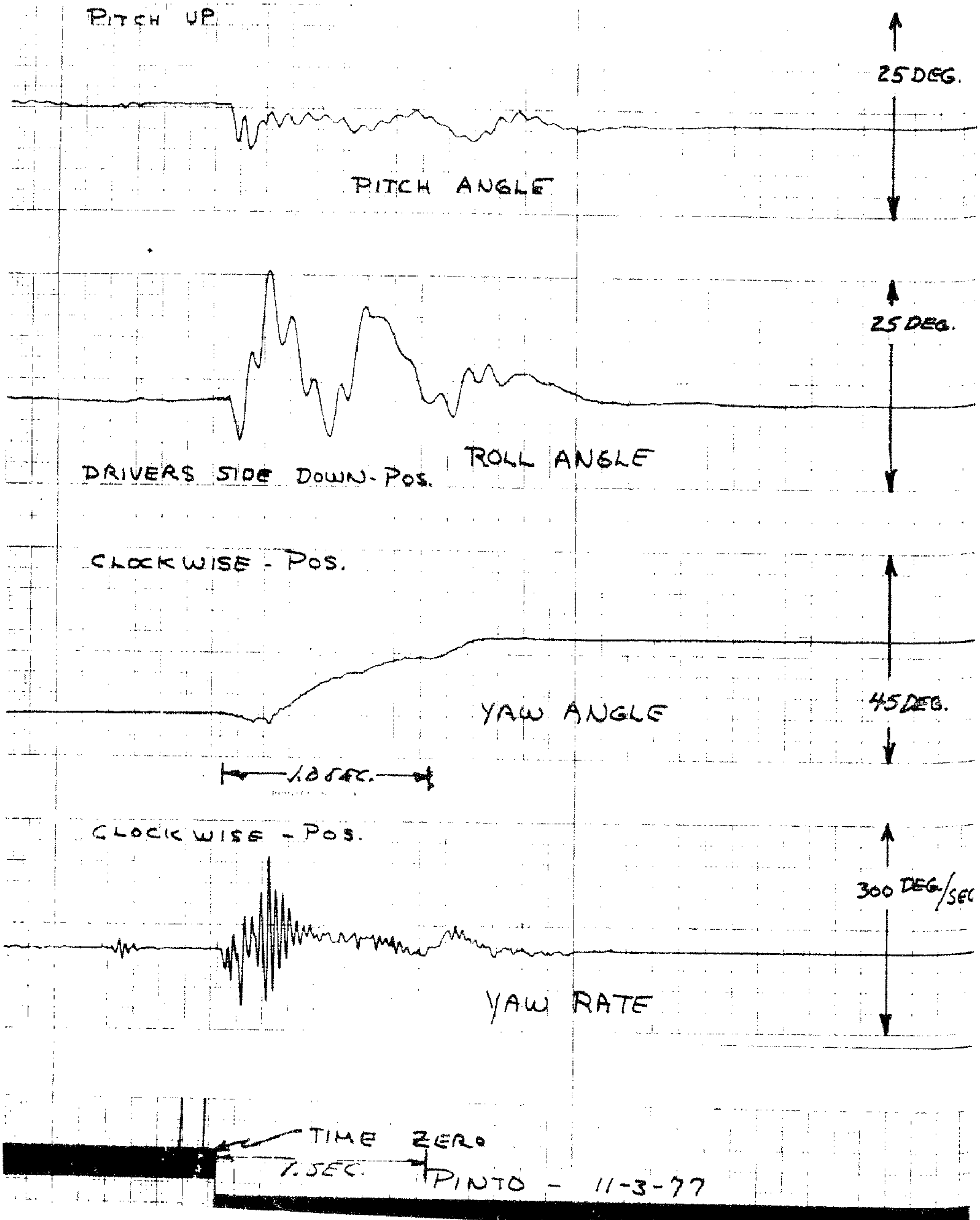


Figure 7-17 TEST NO.1
CAR NO. 2 VEHICLE ATTITUDE

RICSAC TEST NO. 1

VEHICLE RESPONSES

CAR NO. 1 CHEVELLE

DATA PLOTS

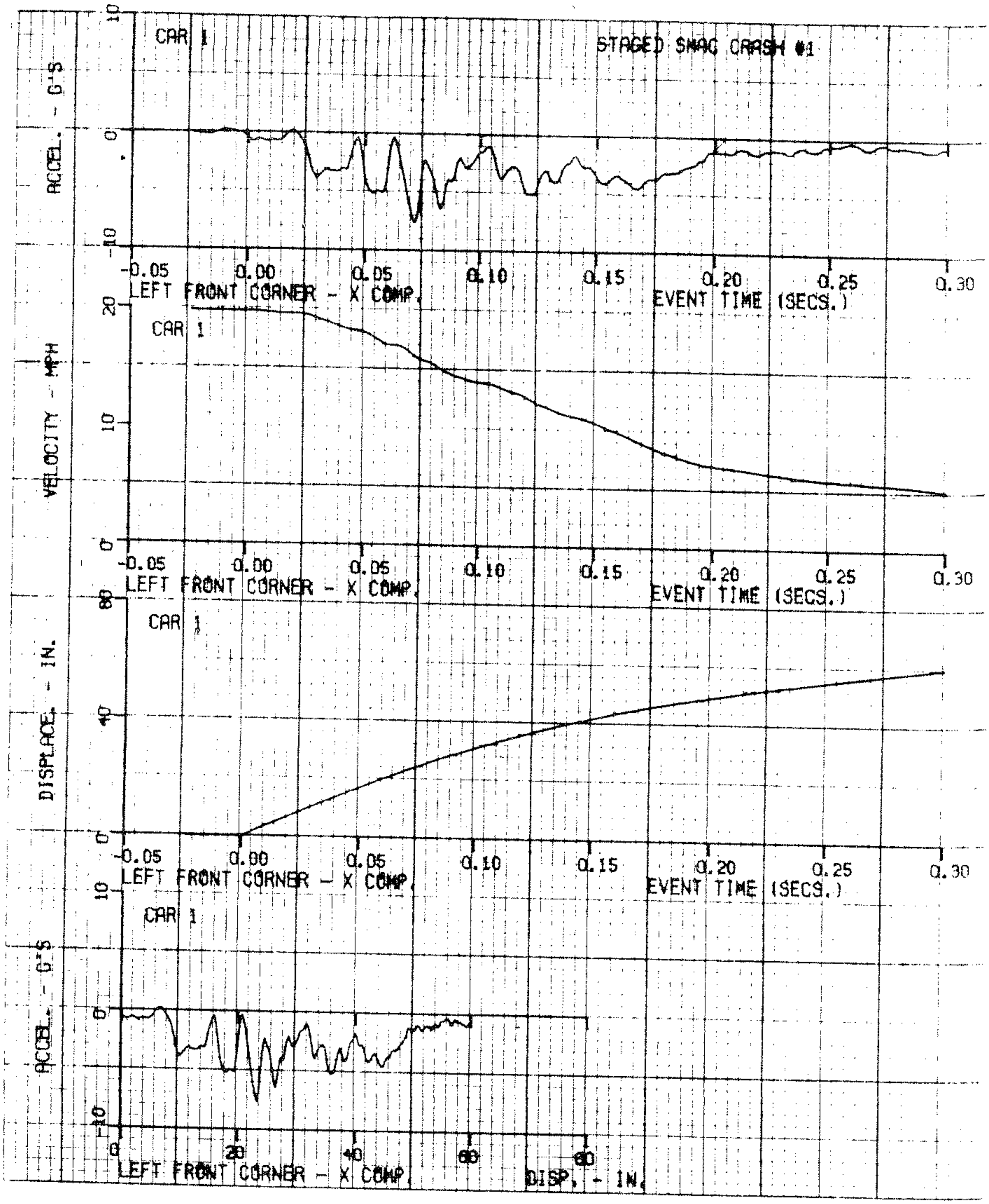
ACCELERATION TIME HISTORIES

VELOCITY TIME HISTORIES

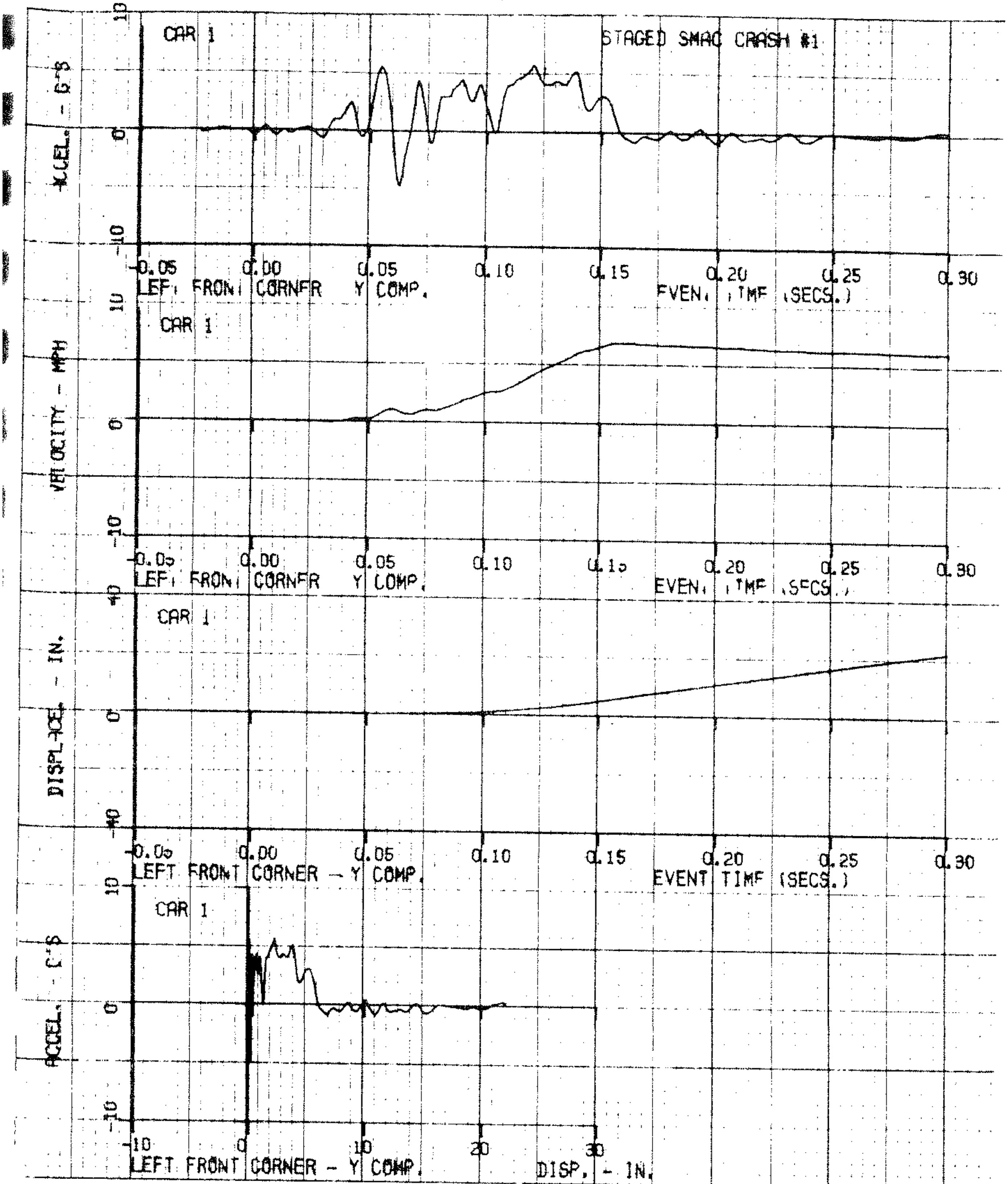
DISPLACEMENT TIME HISTORIES

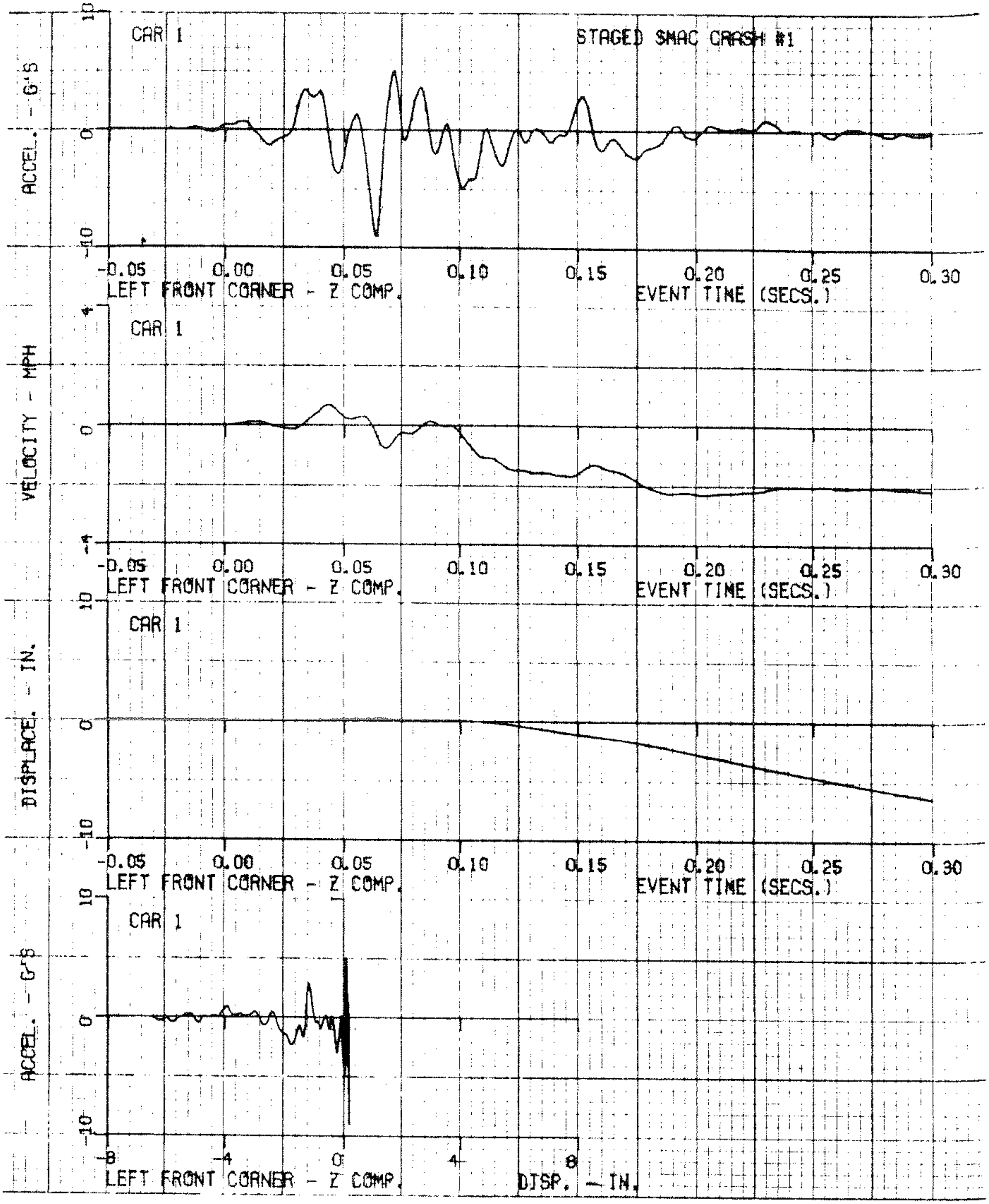
ACCELERATION VS DISPLACEMENT

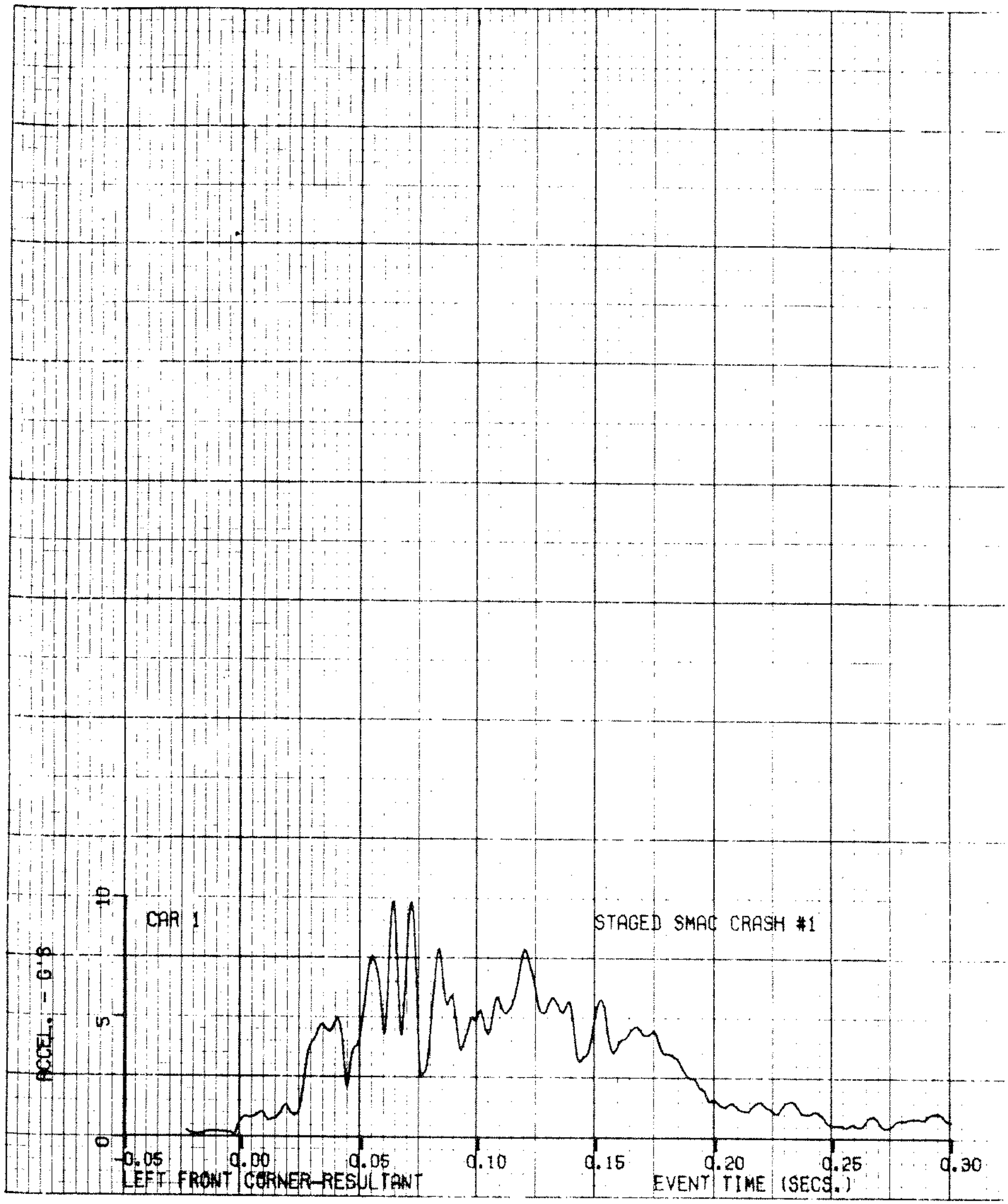
FILTER CLASS 60

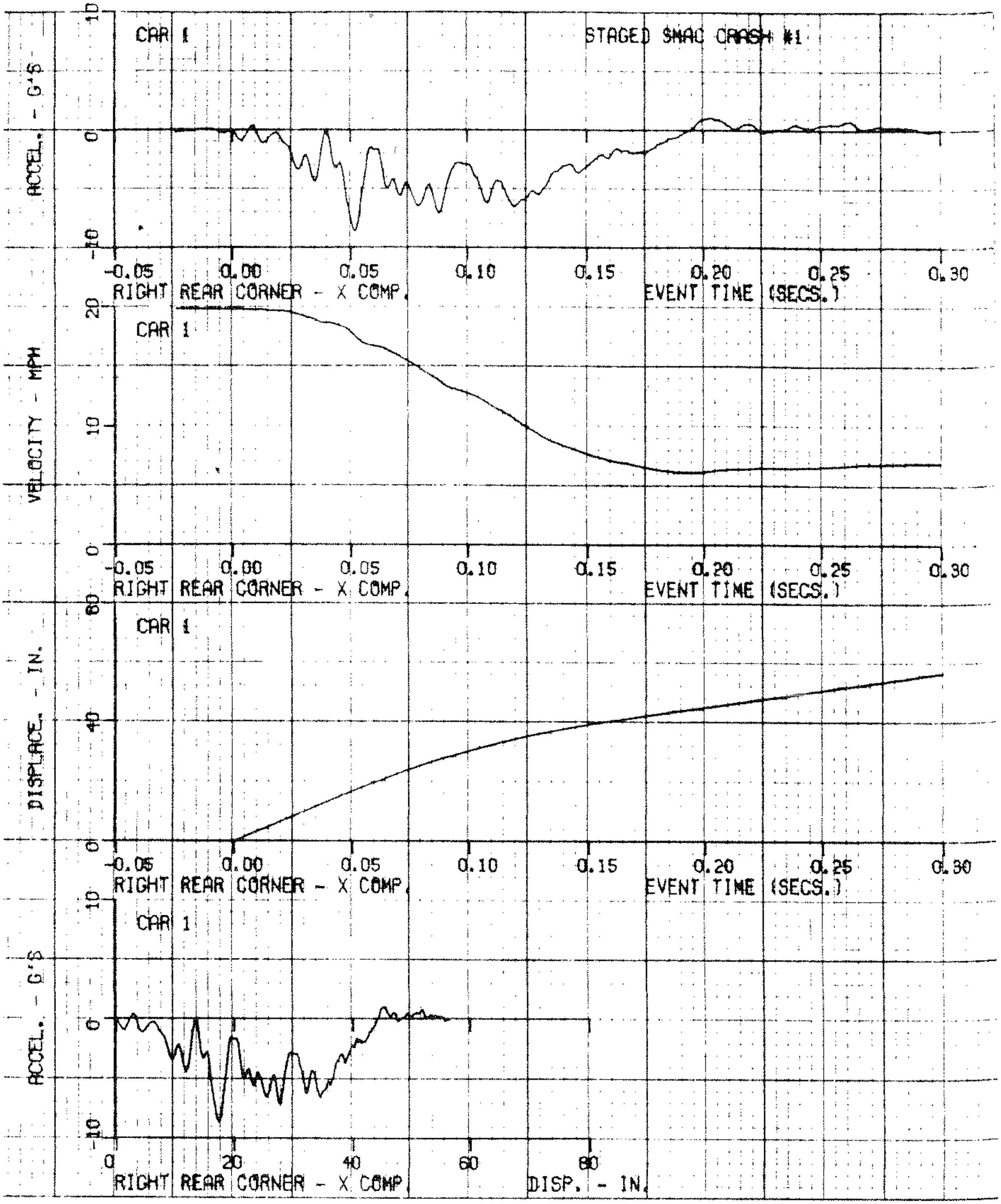

CAR 1
STAGED SNAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
20
10
0
DISPLACE. - IN.
80
40
0
10
0
-10
0
20
40
60
80
DISP. - IN.

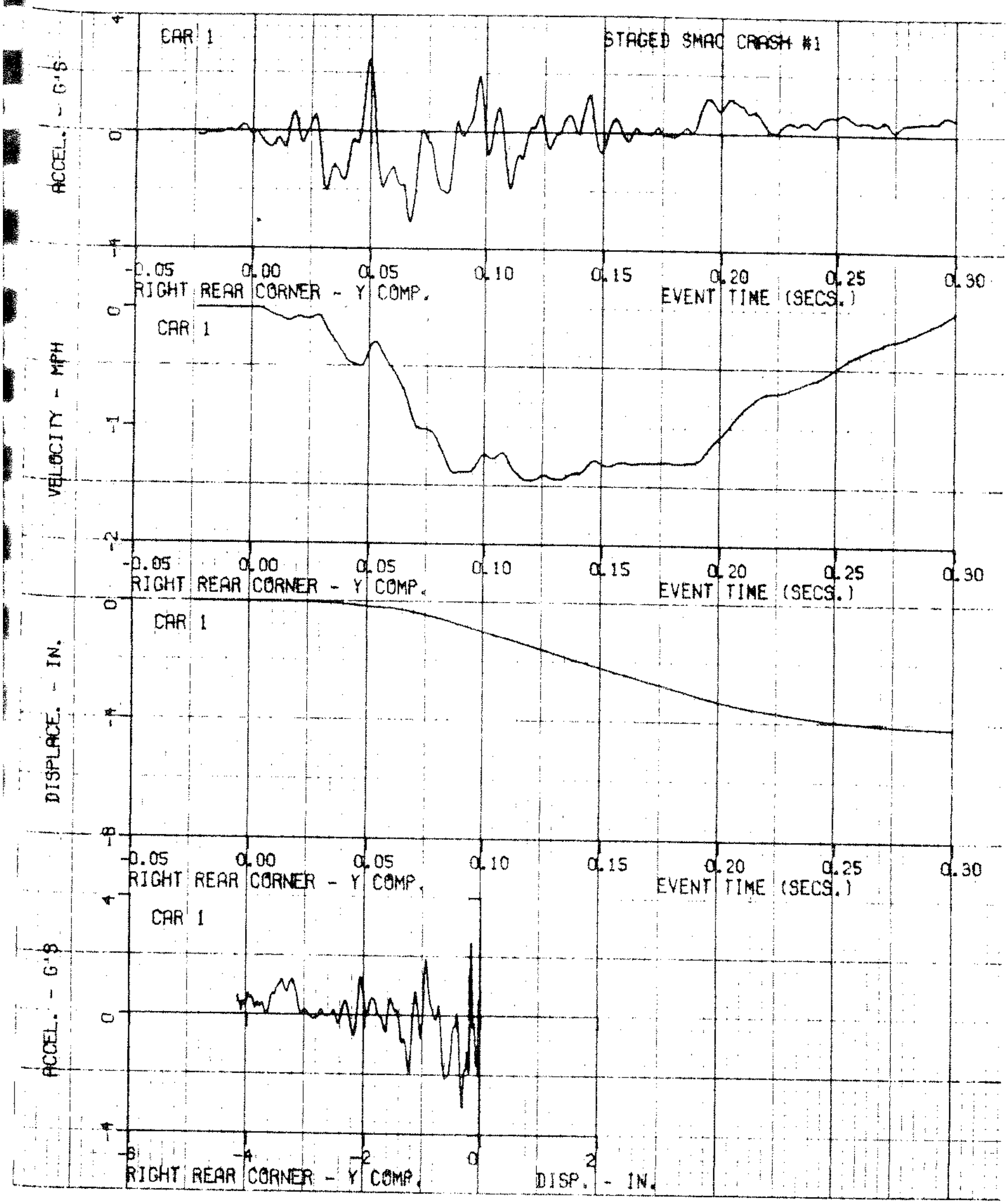
ZQ-6057-V-4

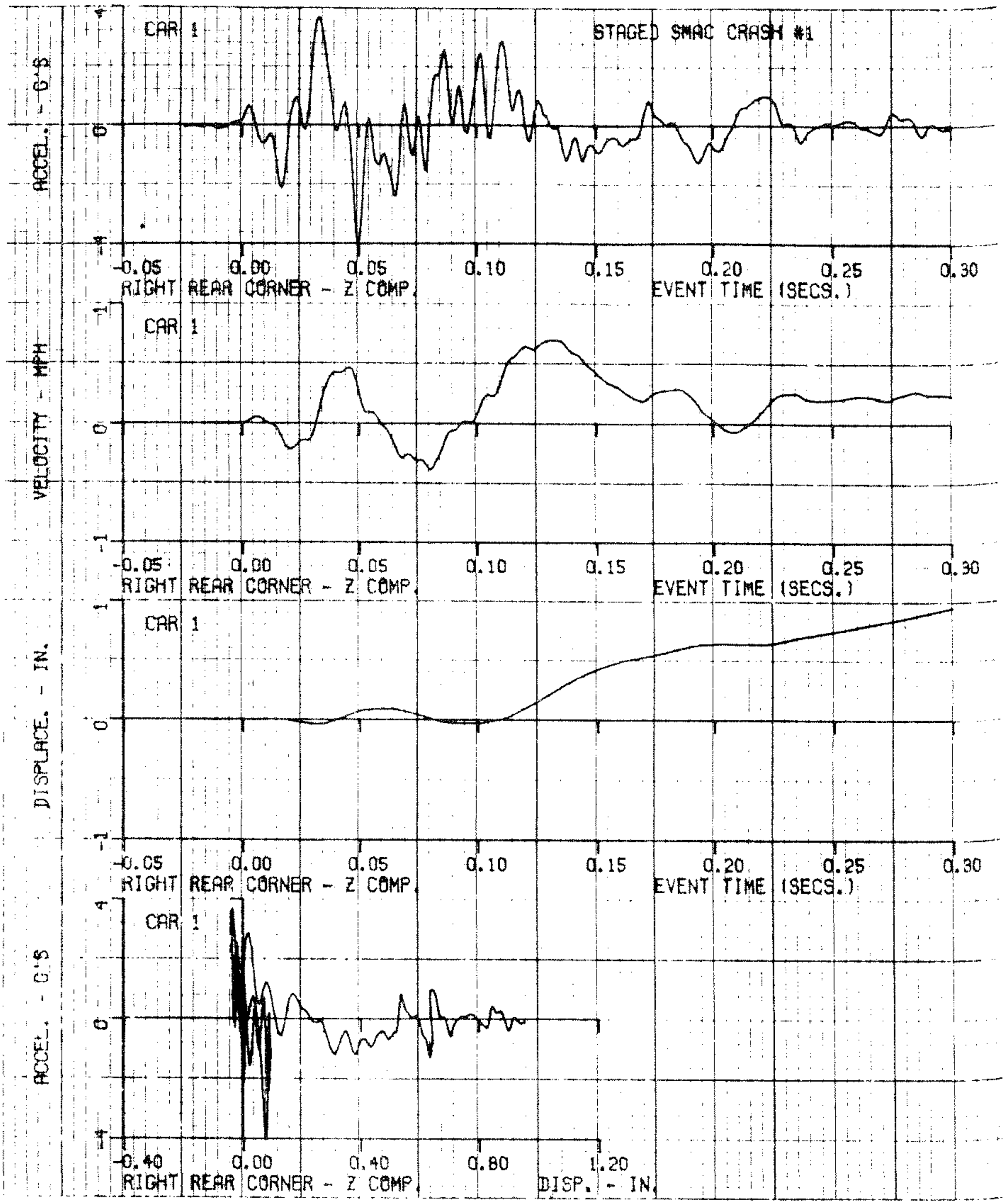

CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACEL - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-10
0
10
20
30
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

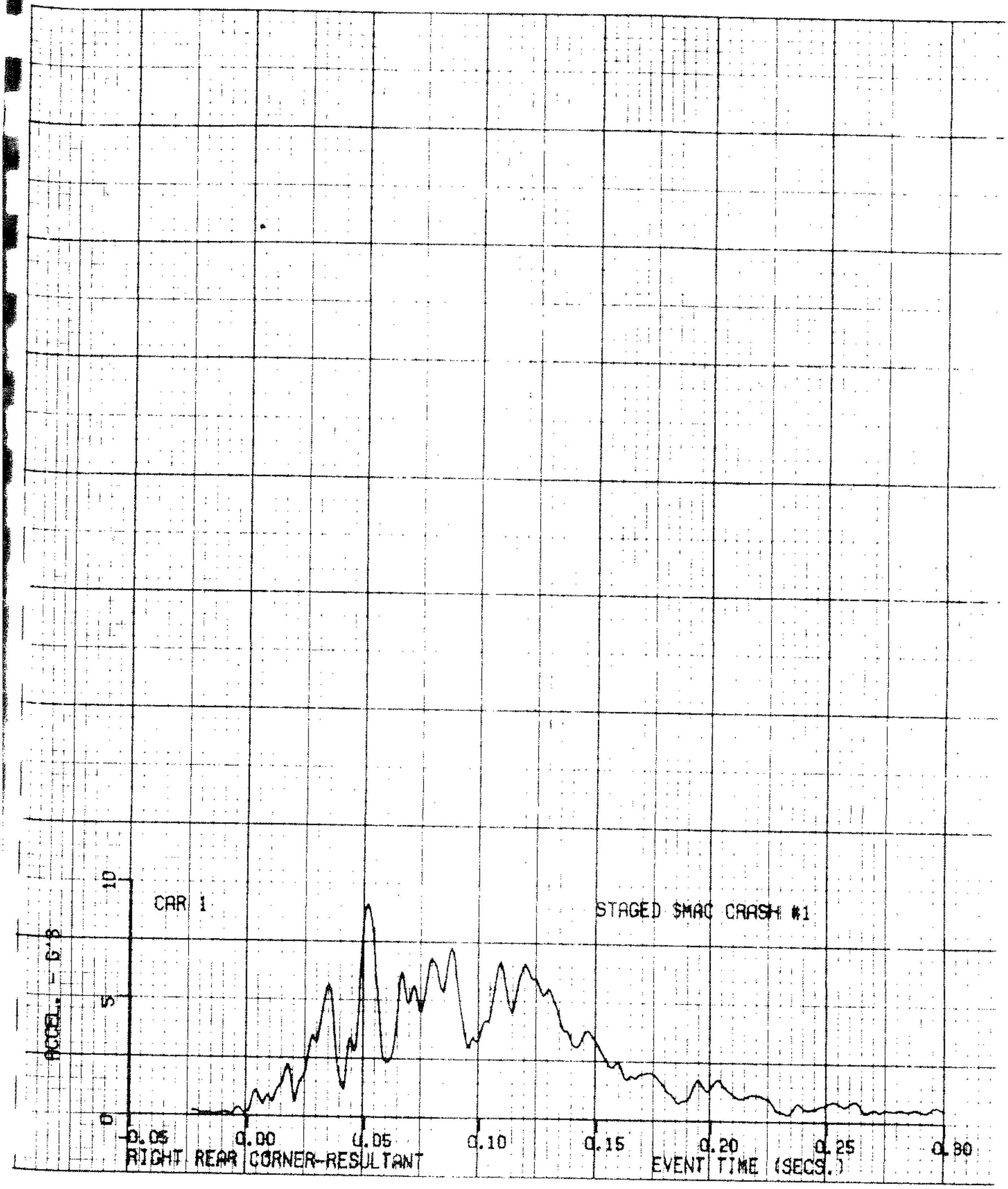

STAGED SMAC CRASH #1
CAR 1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
10
0
-10
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-8
-4
0
4
8
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

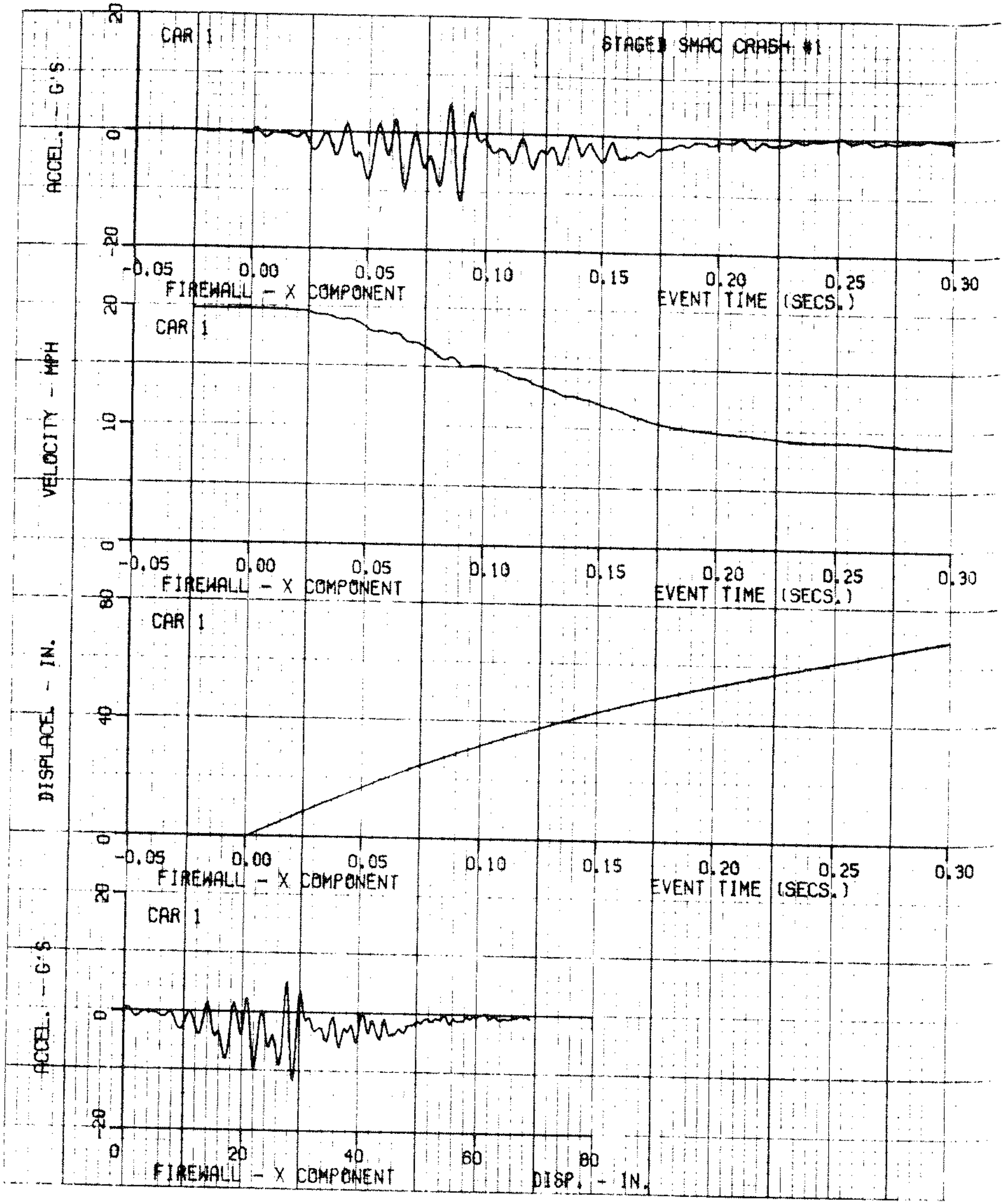

CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
0
5
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

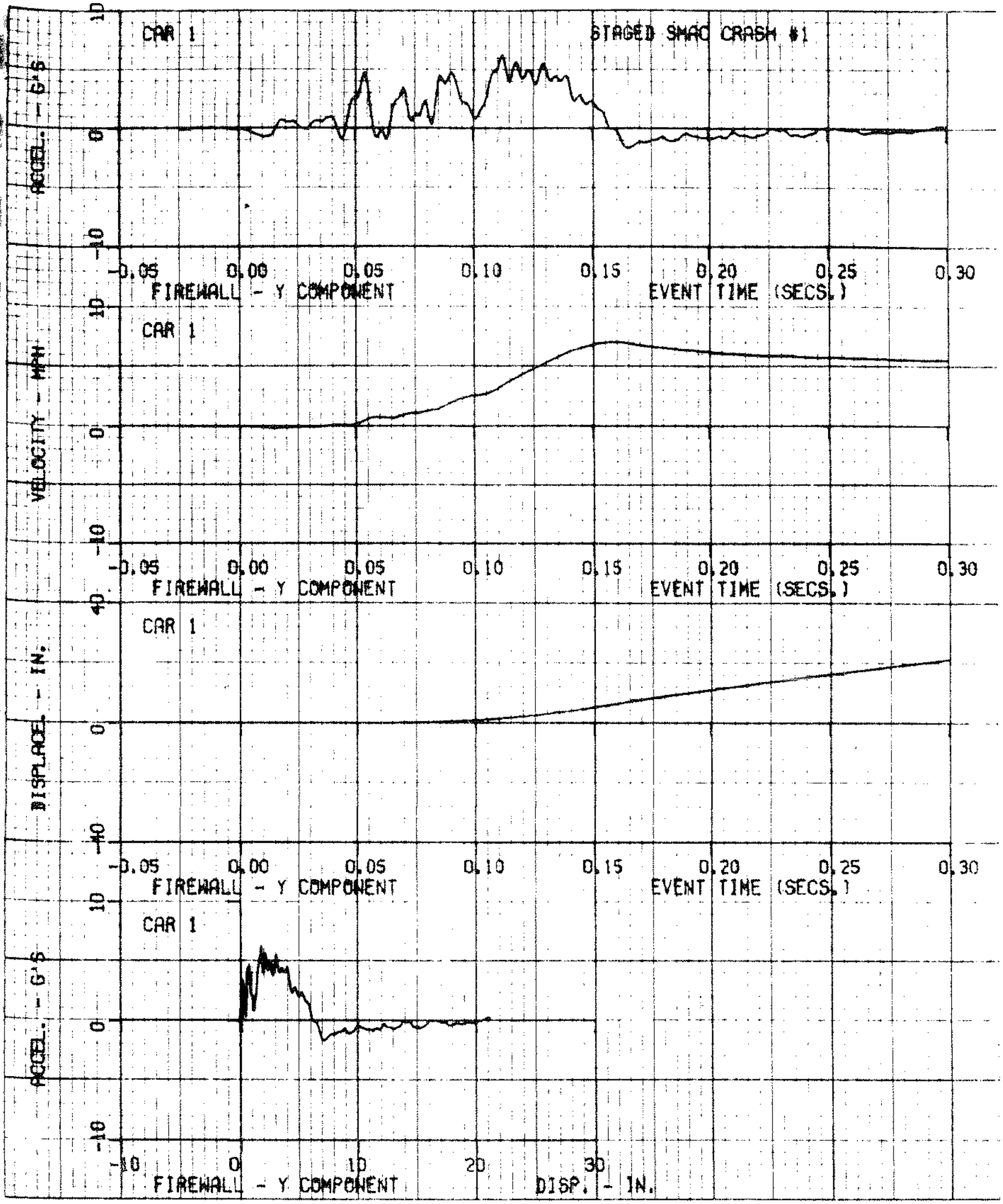

CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
20
40
60
80
RIGHT REAR CORNER - X COMP.
DISP. - IN.


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
0
-1
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-4
-8
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
4
0
-4
-6
-4
-2
0
2
RIGHT REAR CORNER - Y COMP.
DISP. - IN.


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
4
0
-4
-0.40
0.00
0.40
0.80
1.20
RIGHT REAR CORNER - Z COMP.
DISP. - IN.

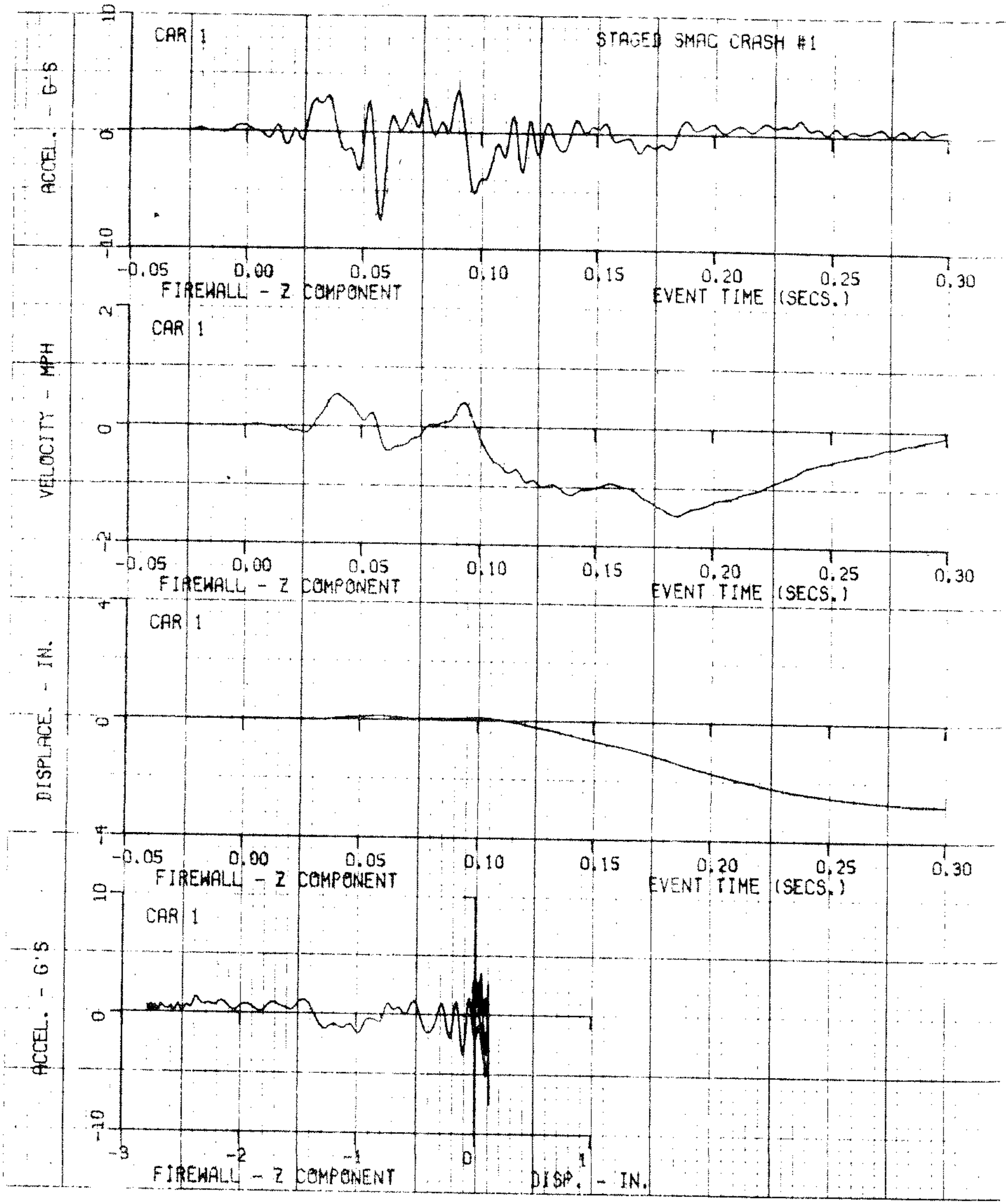

CAR 1
STAGED $MAC CRASH #1
ACCEL. - G'S
10
5
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER-RESULTANT
EVENT TIME (SECS.)

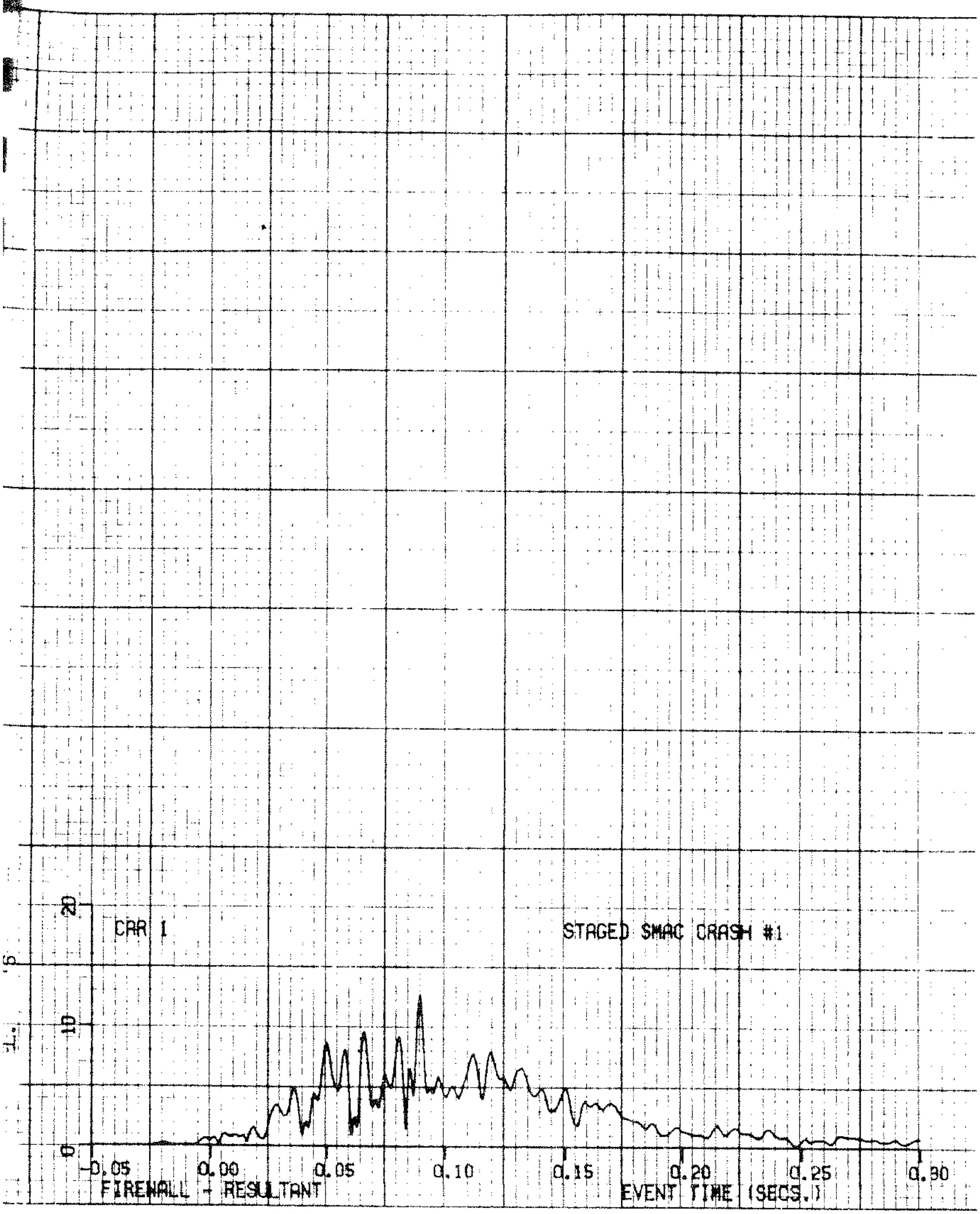

CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
0
20
40
60
80
FIREWALL - X COMPONENT
DISP. - IN.

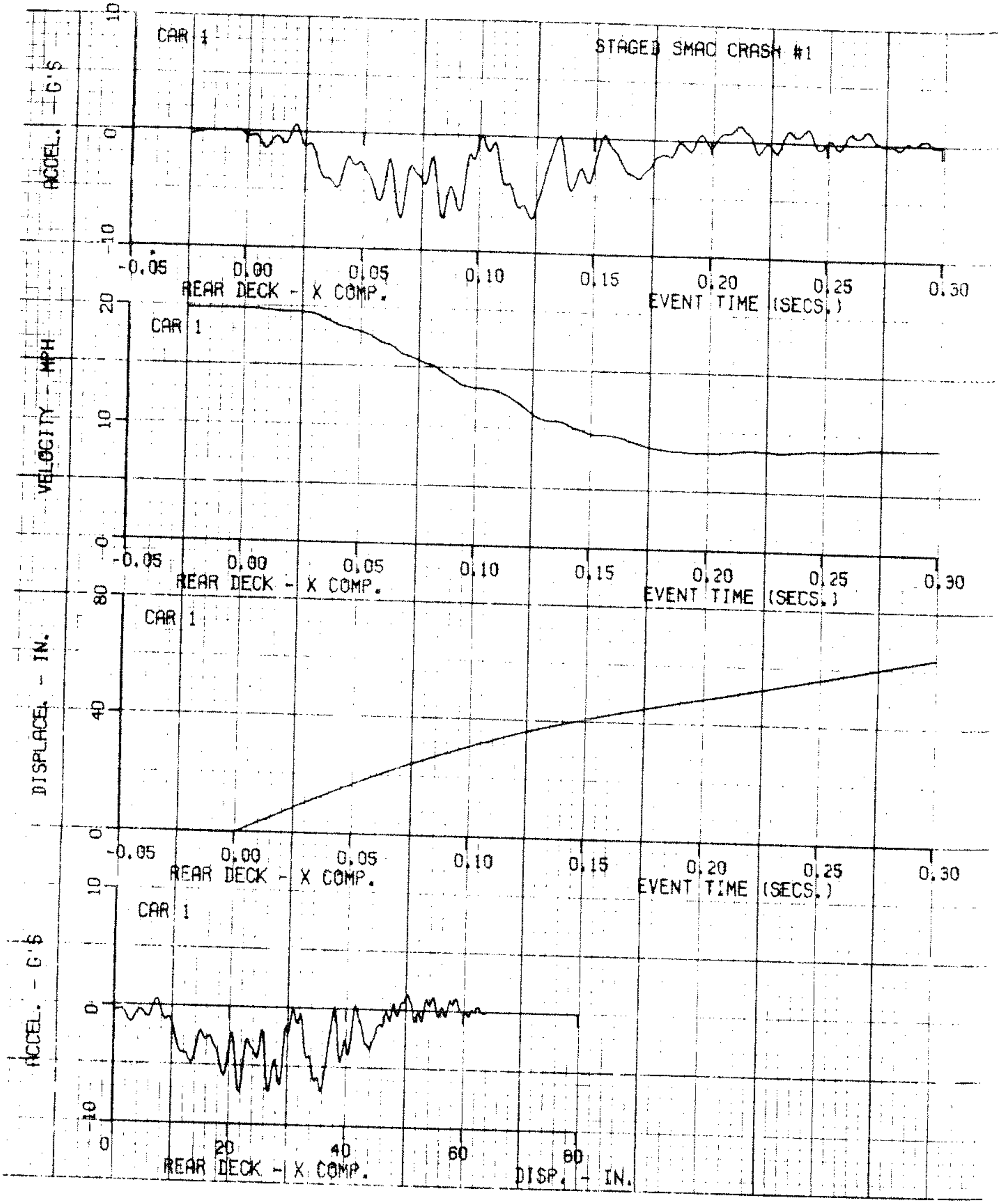


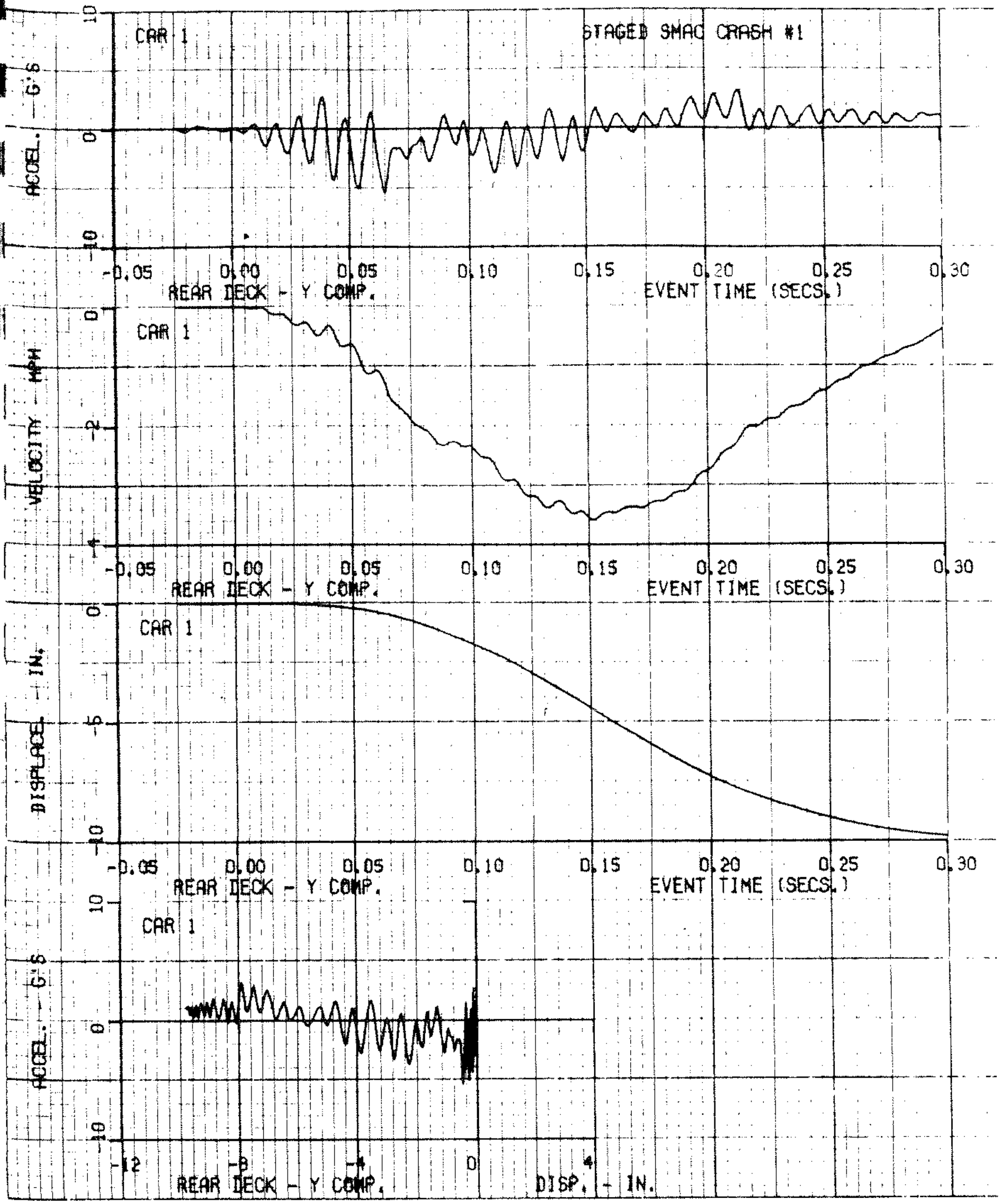
CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-10
0
10
20
30
FIREWALL - Y COMPONENT
DISP. - IN.

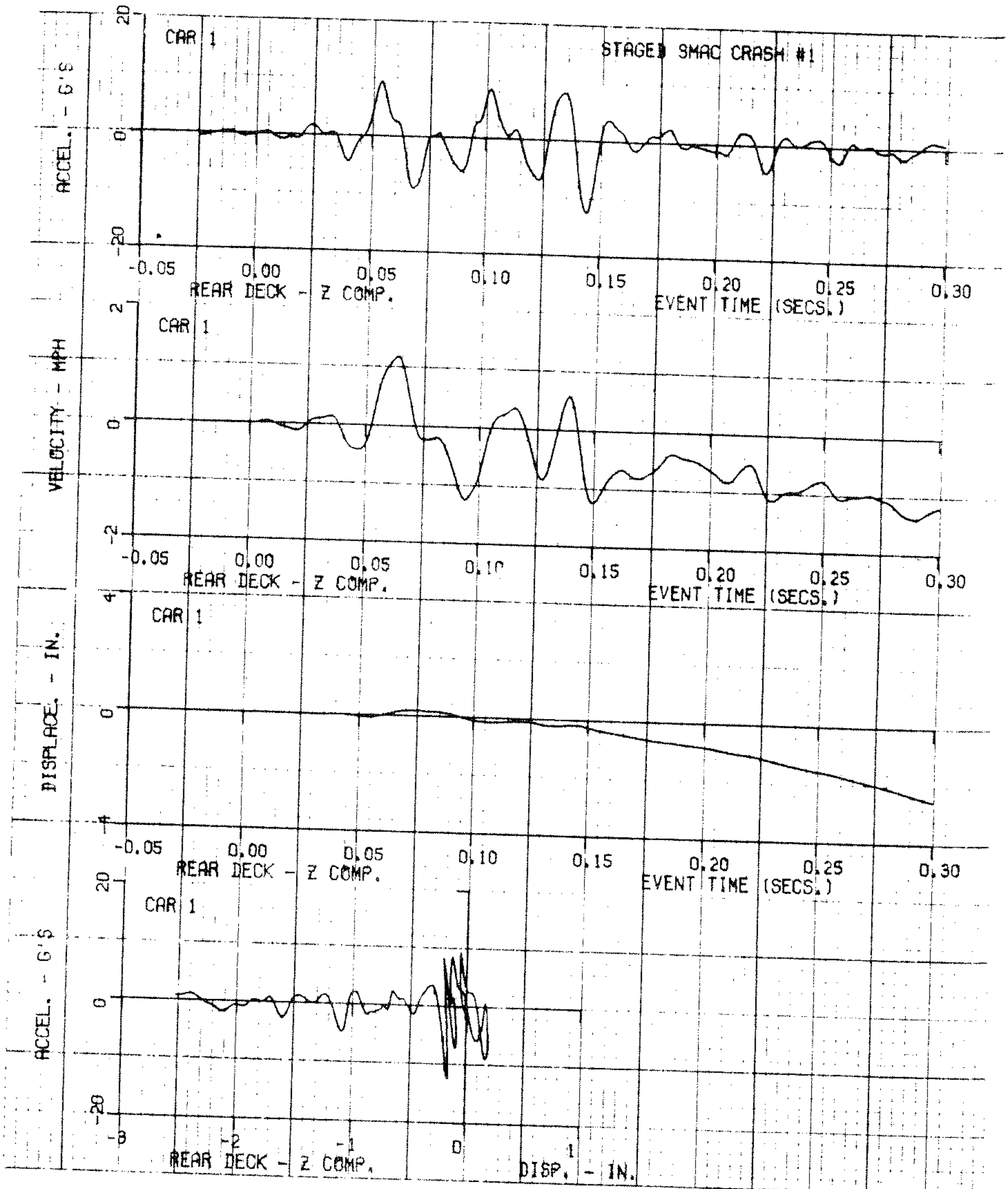
ZQ-6057-V-4


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-3
-2
-1
0
1
FIREWALL - Z COMPONENT
DISP. - IN.

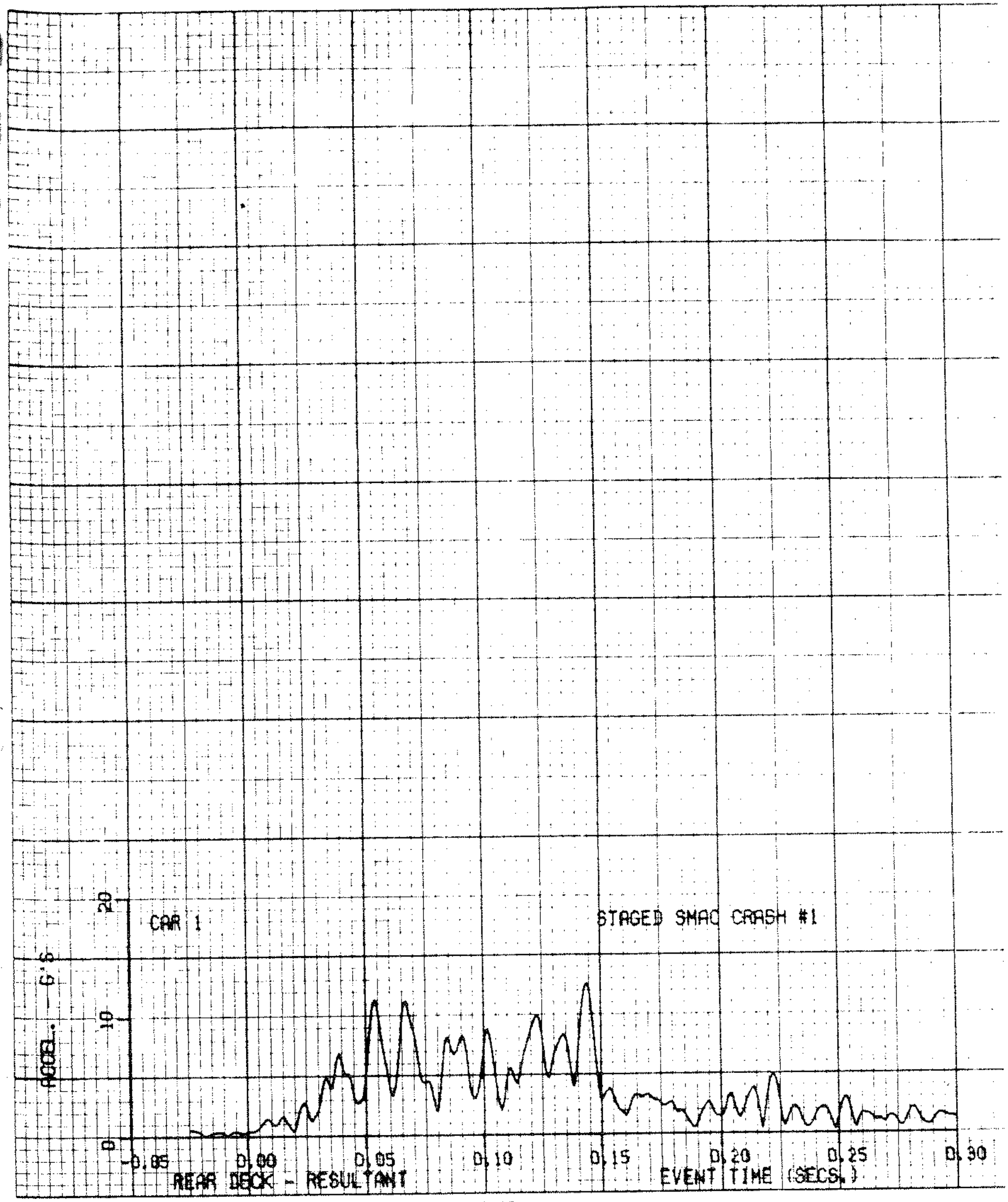

CAR 1
STAGED SMAC CRASH #1
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
20
10
0
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
20
40
60
80
REAR DECK - X COMP.
DISP. - IN.

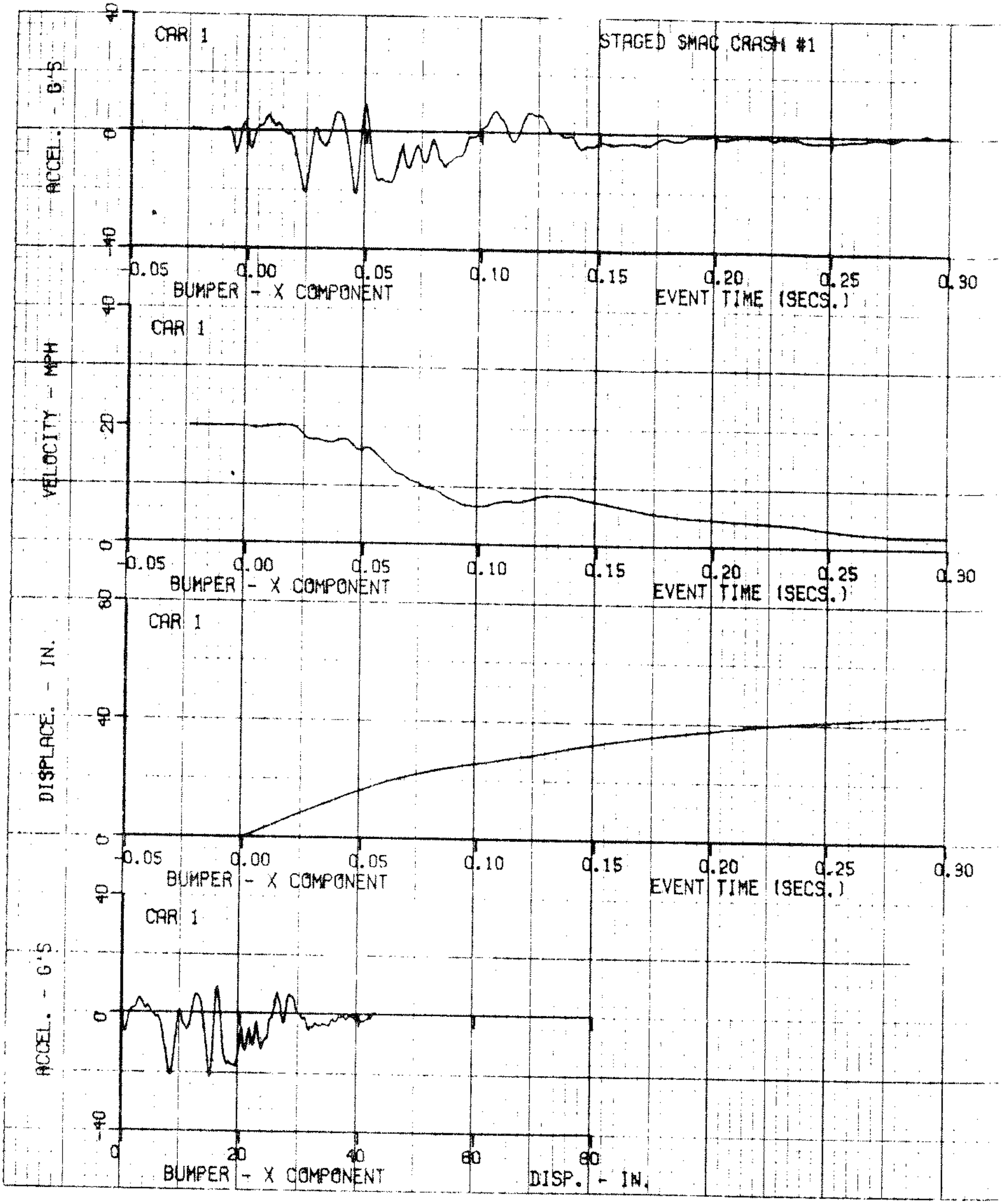

STAGED SMAC CRASH #1
CAR 1
ACCEL. — G'S
REAR DECK – Y COMP.
EVENT TIME (SECS.)
VELOCITY — MPH
DISPLACE. — IN.
DISP. – IN.
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
-12 -8 -4 0 4


STAGED SMAC CRASH #1
CAR 1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
-3
-2
-1
0
1
REAR DECK - Z COMP.
DISP. - IN.

DQ-6057-V-4


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)

ZQ-6057-V-5


CAR 1
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
40
0
-40
0
20
40
60
80
BUMPER - X COMPONENT
DISP. - IN.

RICSAC TEST NO. 1

VEHICLE RESPONSES

CAR NO. 2 PINTO

DATA PLOTS

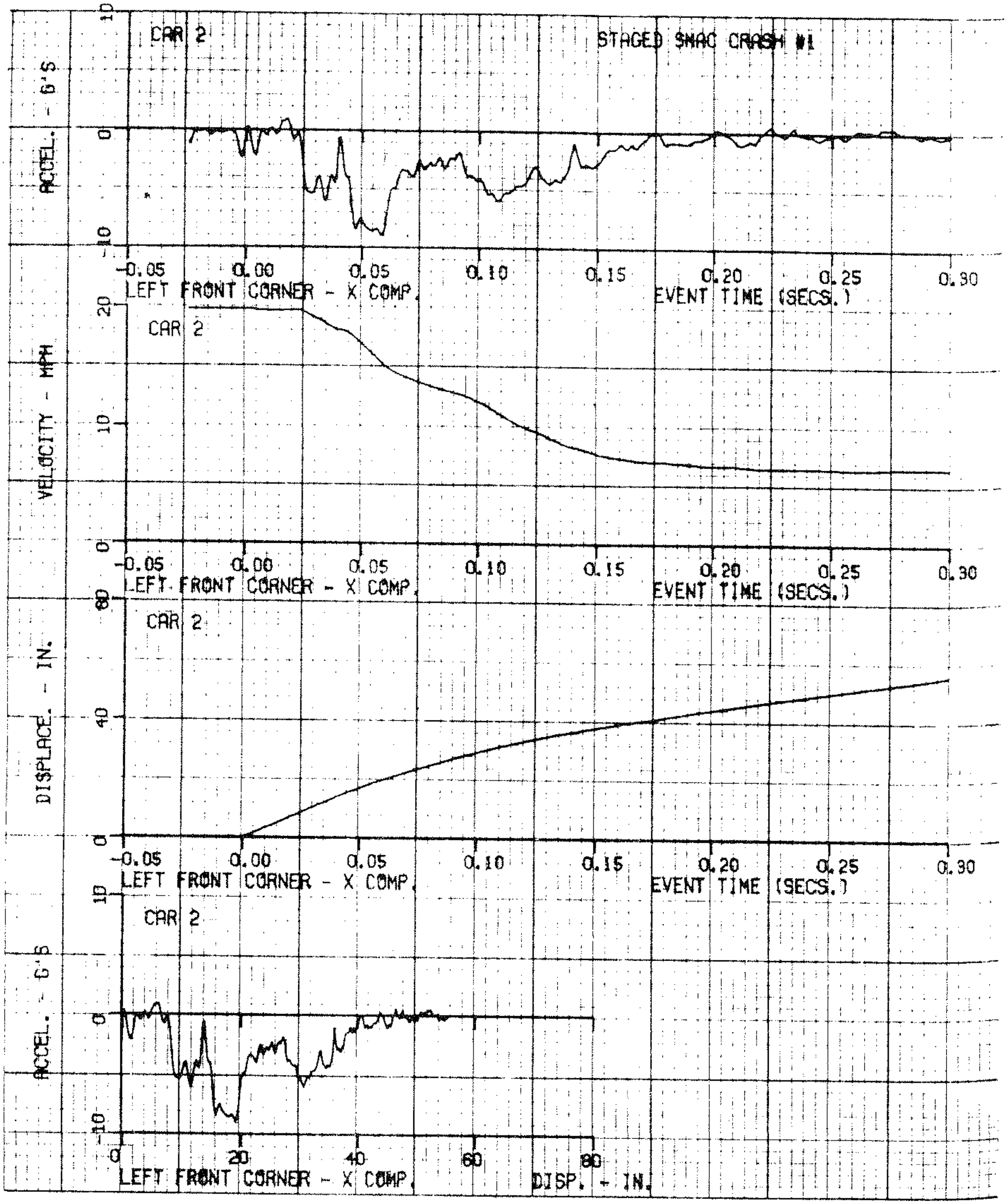
ACCELERATION TIME HISTORIES

VELOCITY TIME HISTORIES

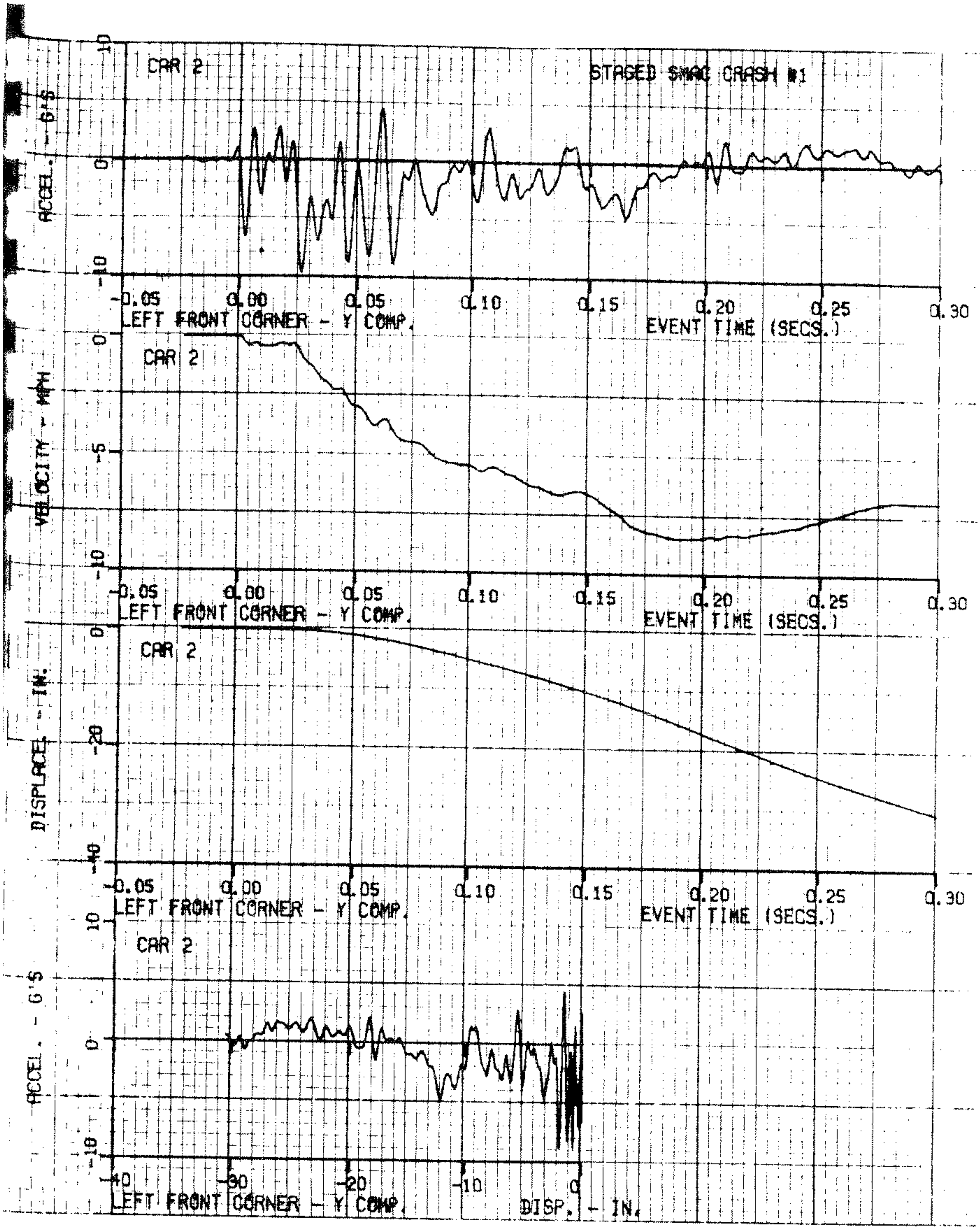
DISPLACEMENT TIME HISTORIES

ACCELERATION VS DISPLACEMENT

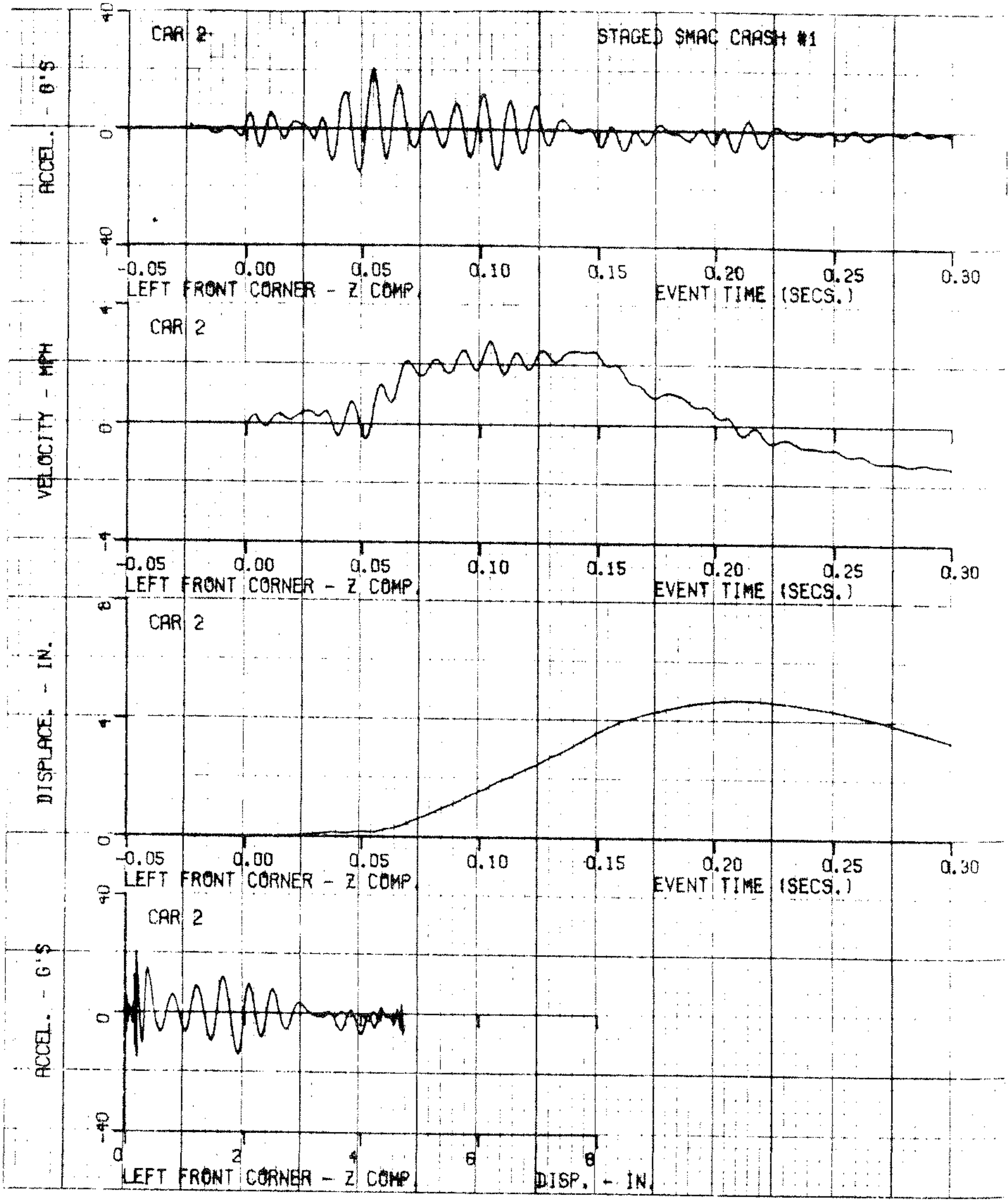
FILTER CLASS 60

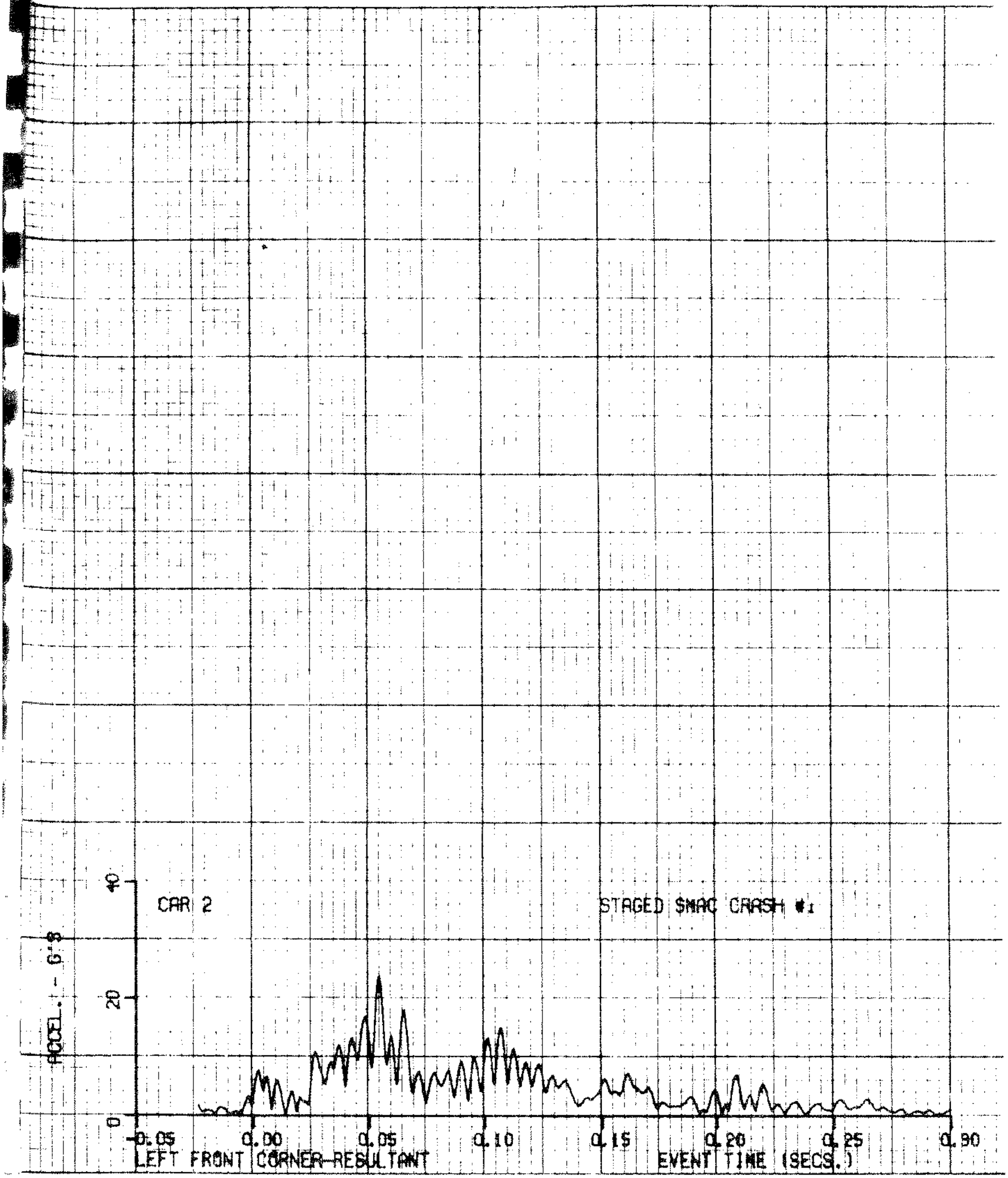

CAR 2
STAGED SNAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
20
10
0
DISPLACE. - IN.
80
40
0
20
40
60
80
DISP. - IN.

ZQ-6057-V-4

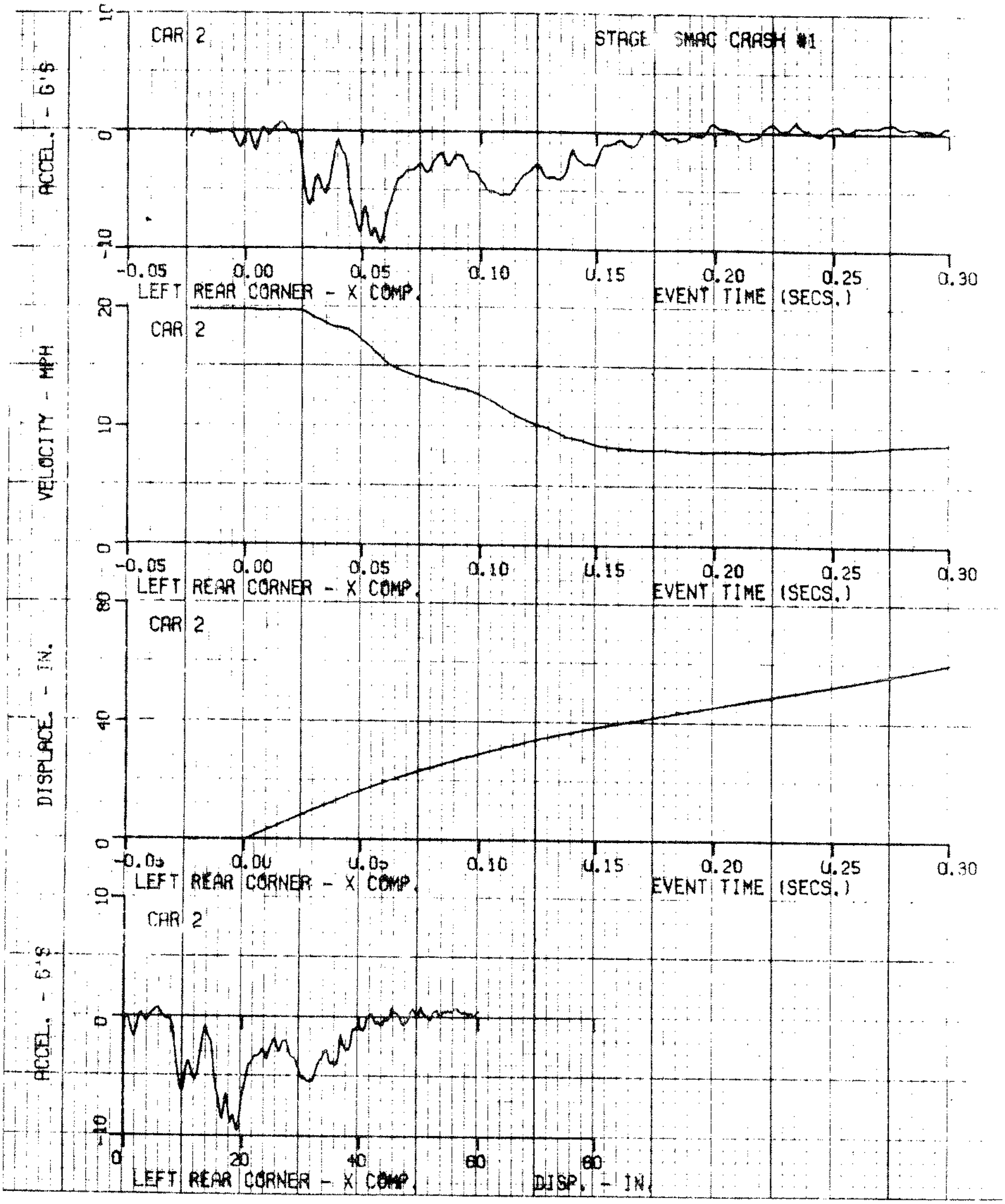

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
CAR 2
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
DISPLACE. - IN.
CAR 2
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
ACCEL. - G'S
CAR 2
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

ZQ-6057-V-4

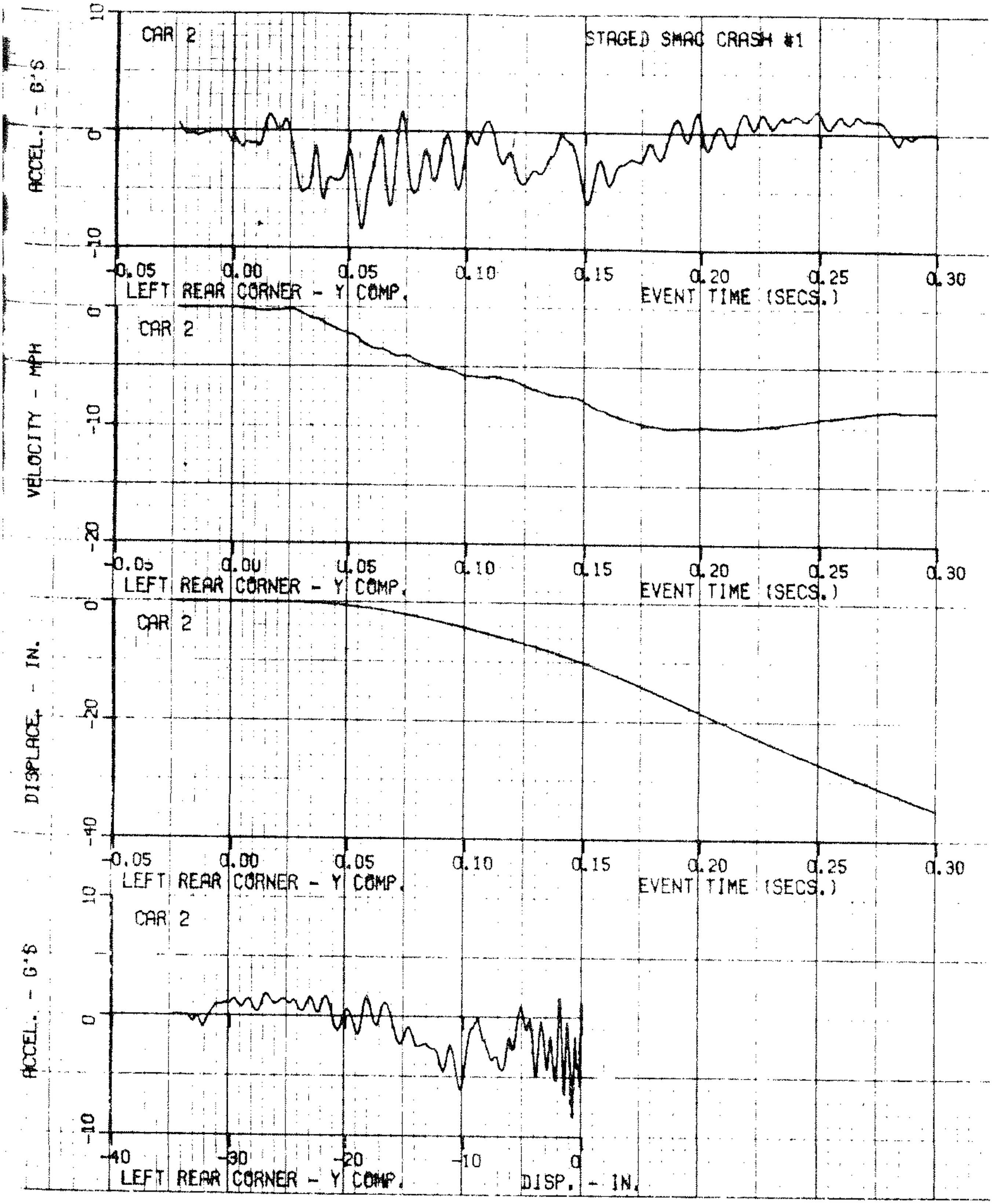

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
8
4
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
2
4
6
8
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

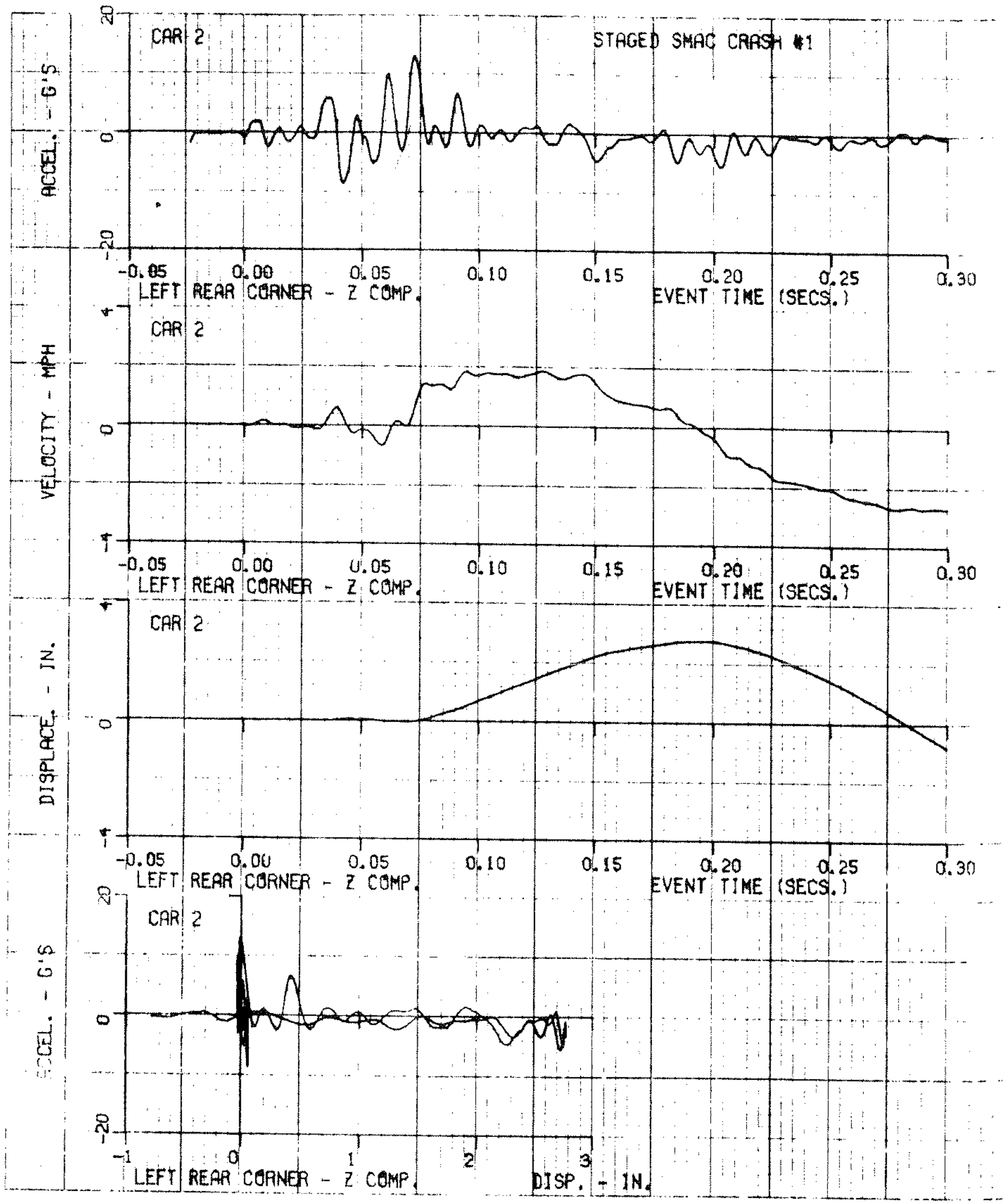


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
0
20
40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

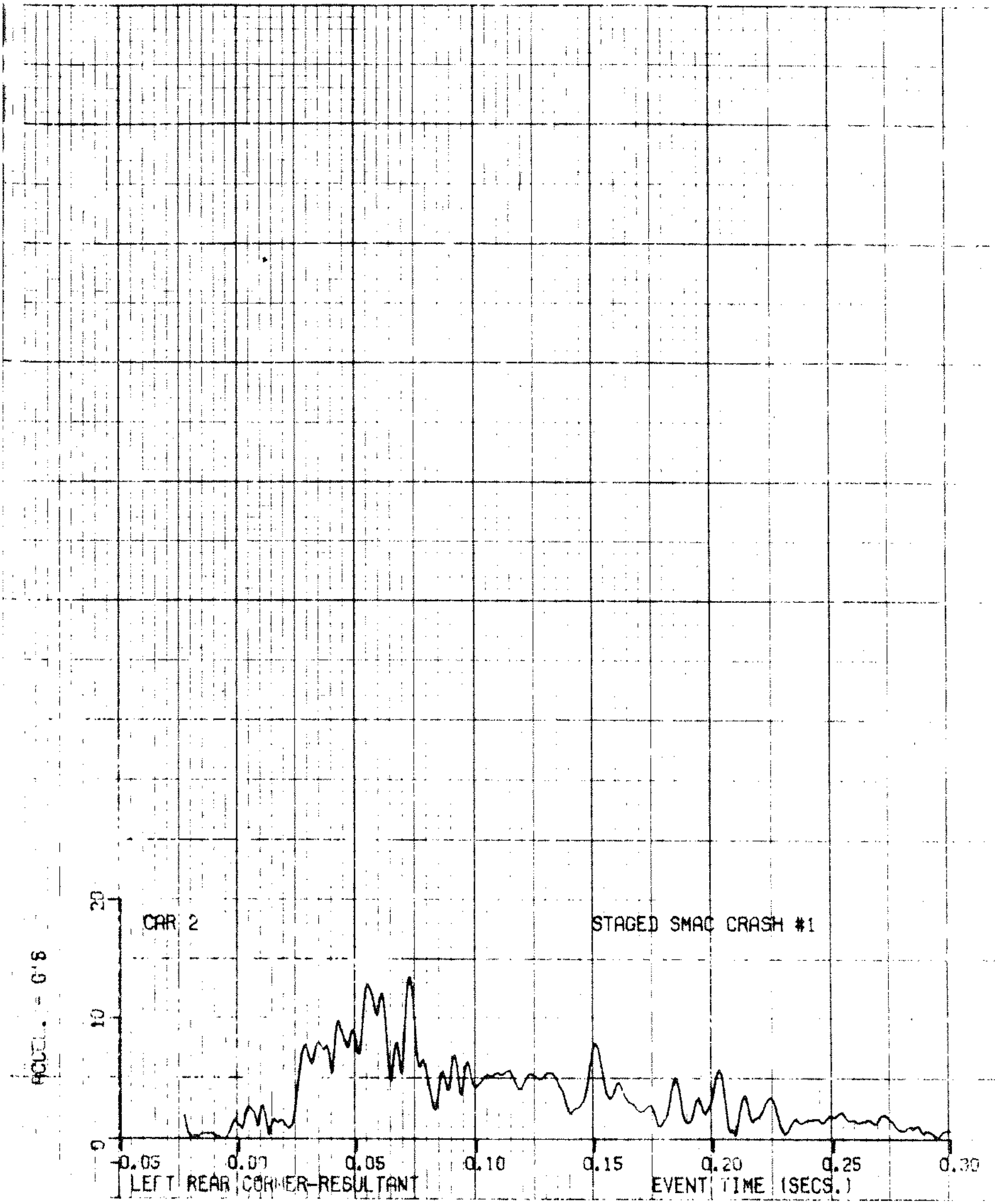

CAR 2
STAGE SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
10
0
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
-10
0
20
40
60
80
LEFT REAR CORNER - X COMP.
DISP. - IN.

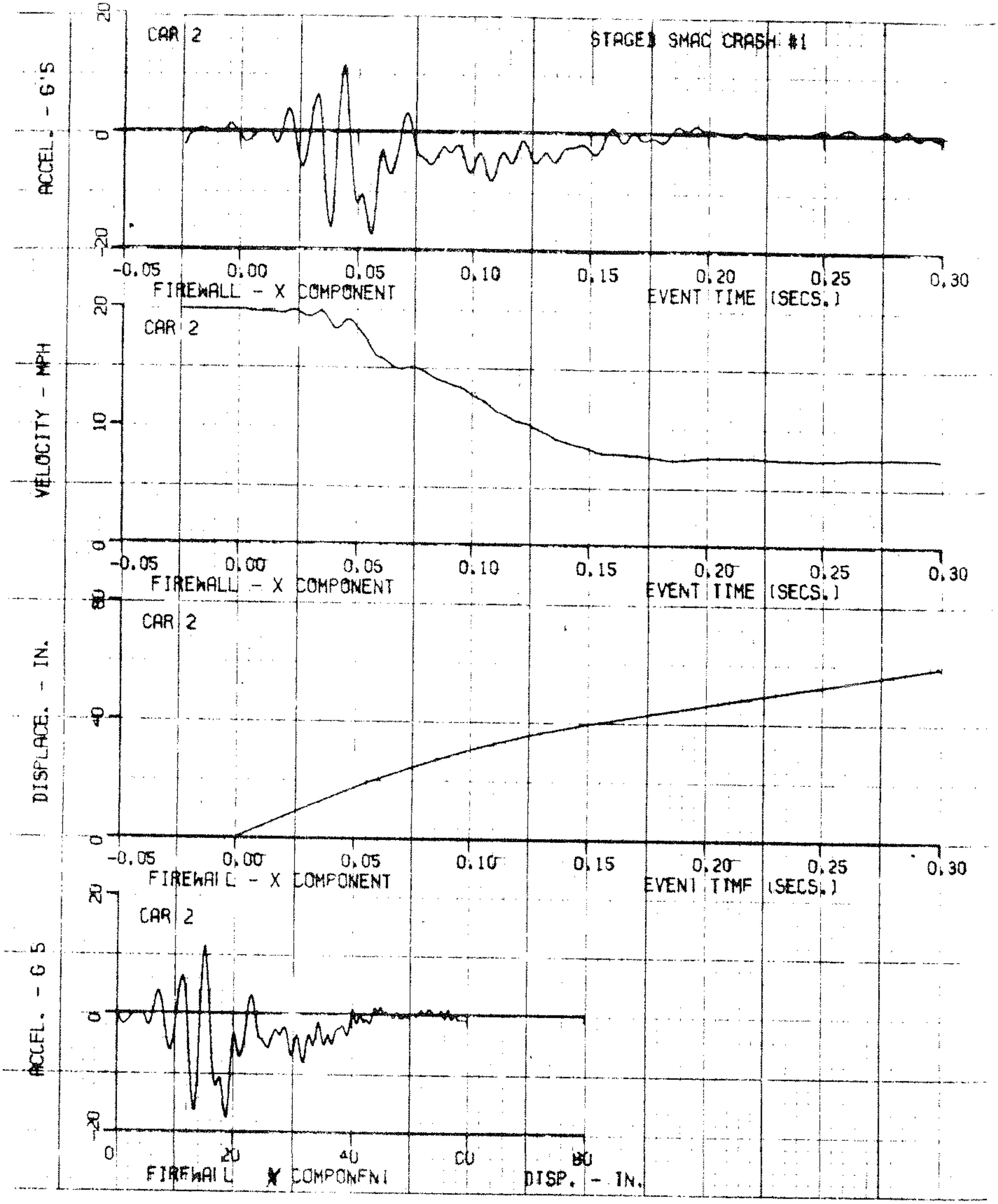
ZQ-6057-V-4

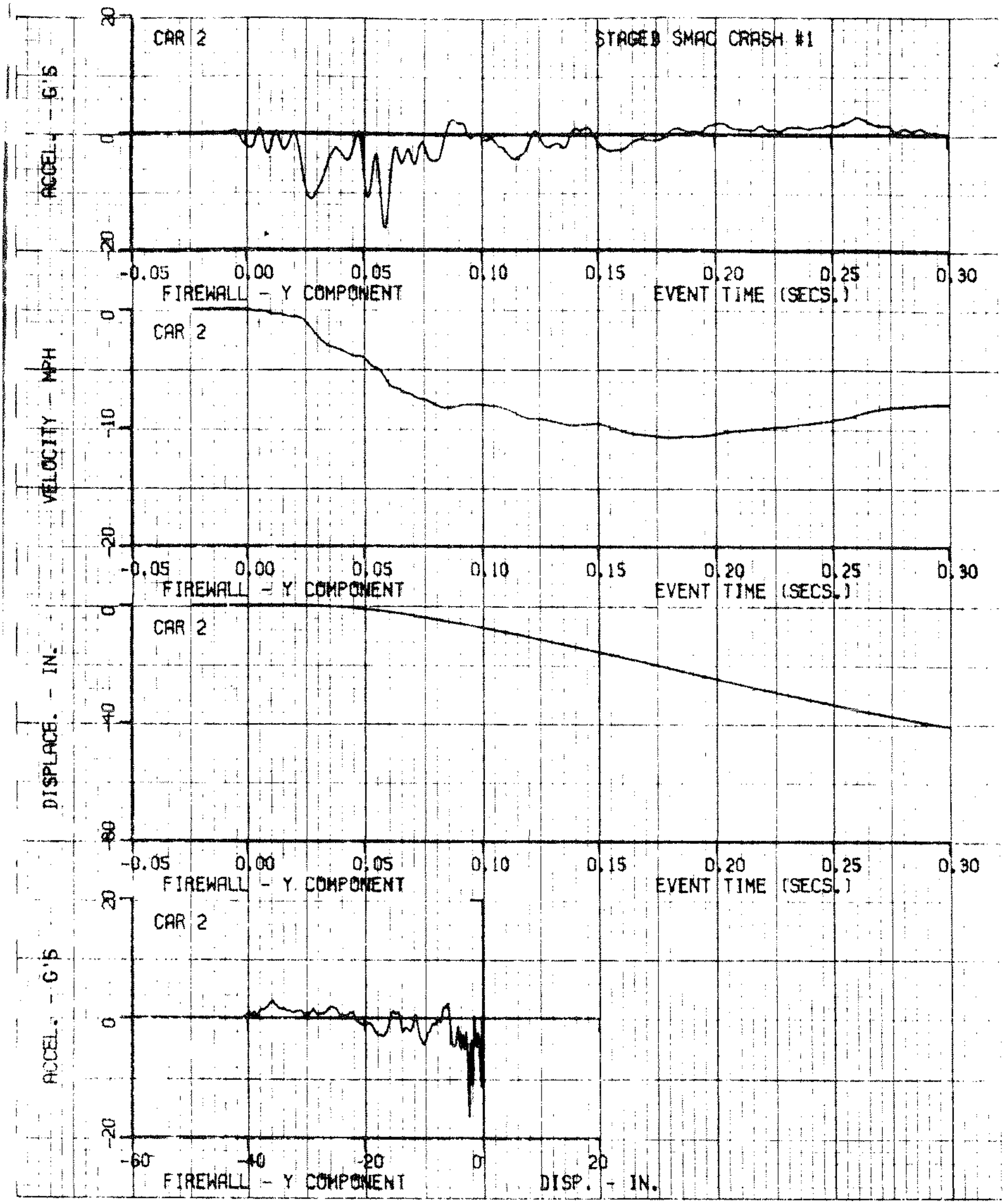

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
0
-10
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-20
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
-10
-40
-30
-20
-10
0
LEFT REAR CORNER - Y COMP.
DISP. - IN.

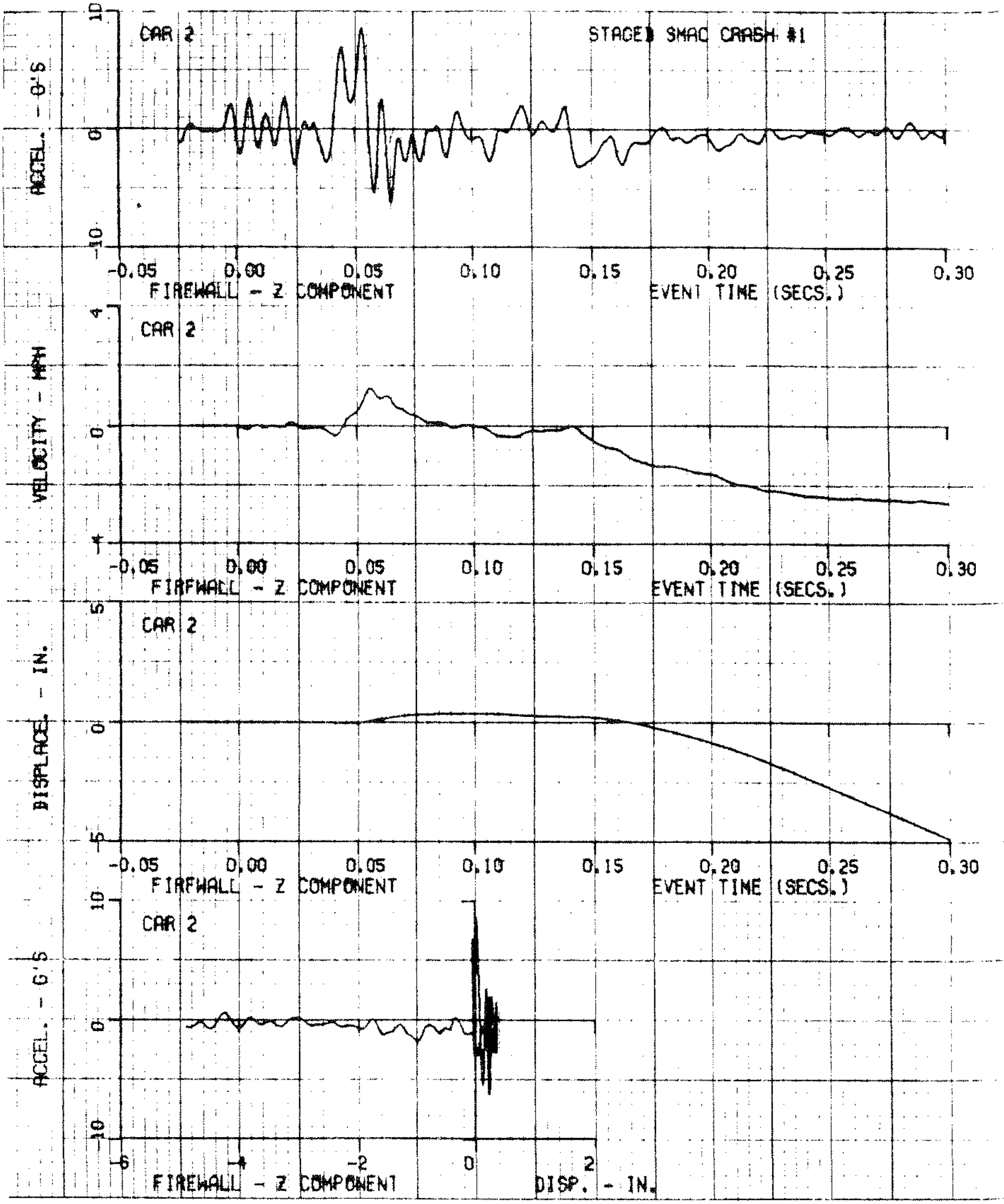

STAGED SMAC CRASH #1
CAR 2
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
4
0
-4
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-1 0 1 2 3
LEFT REAR CORNER - Z COMP.
DISP. - IN.

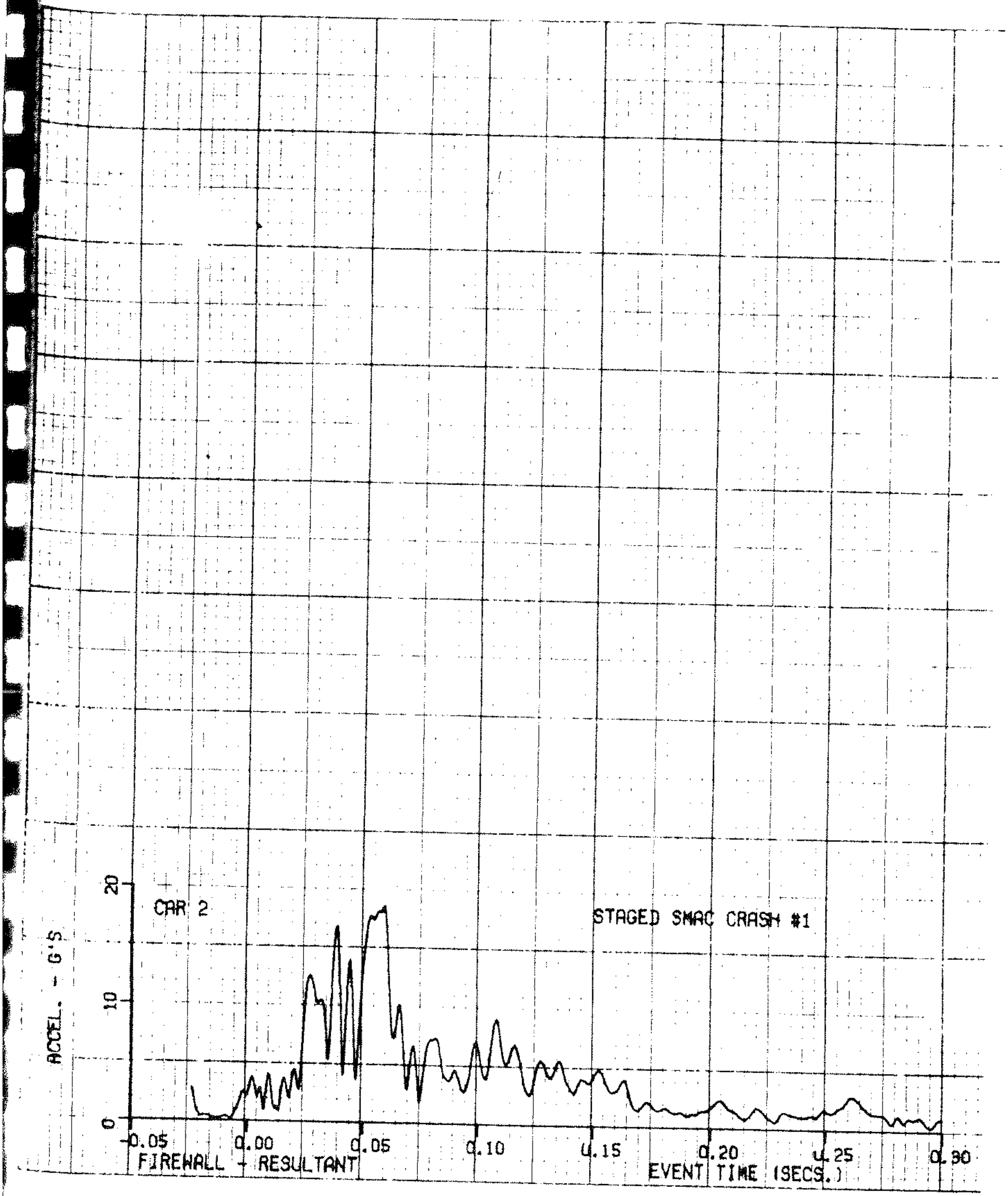
70-6057-V-4

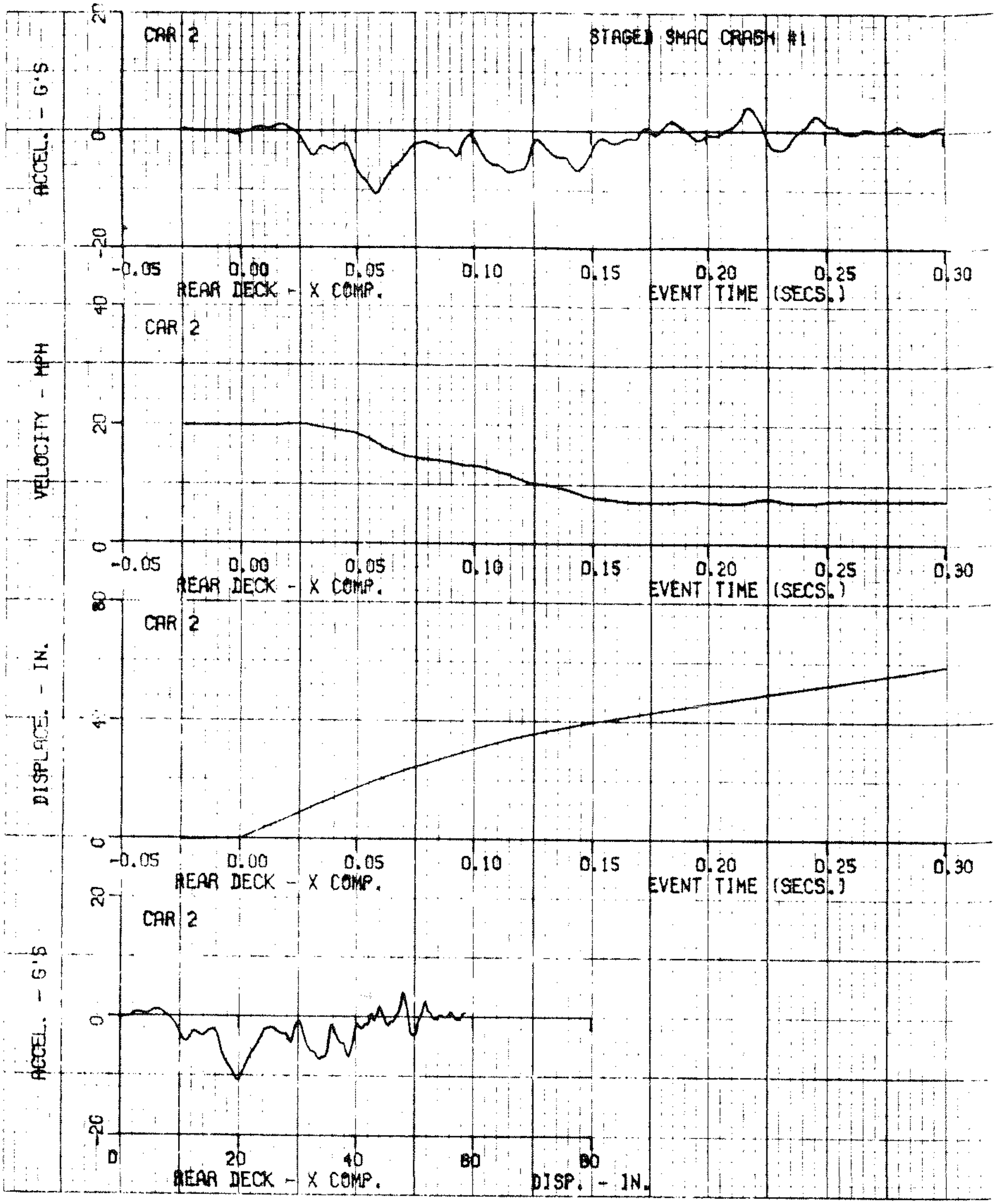

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
20
10
0
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER-RESULTANT
EVENT TIME (SECS.)

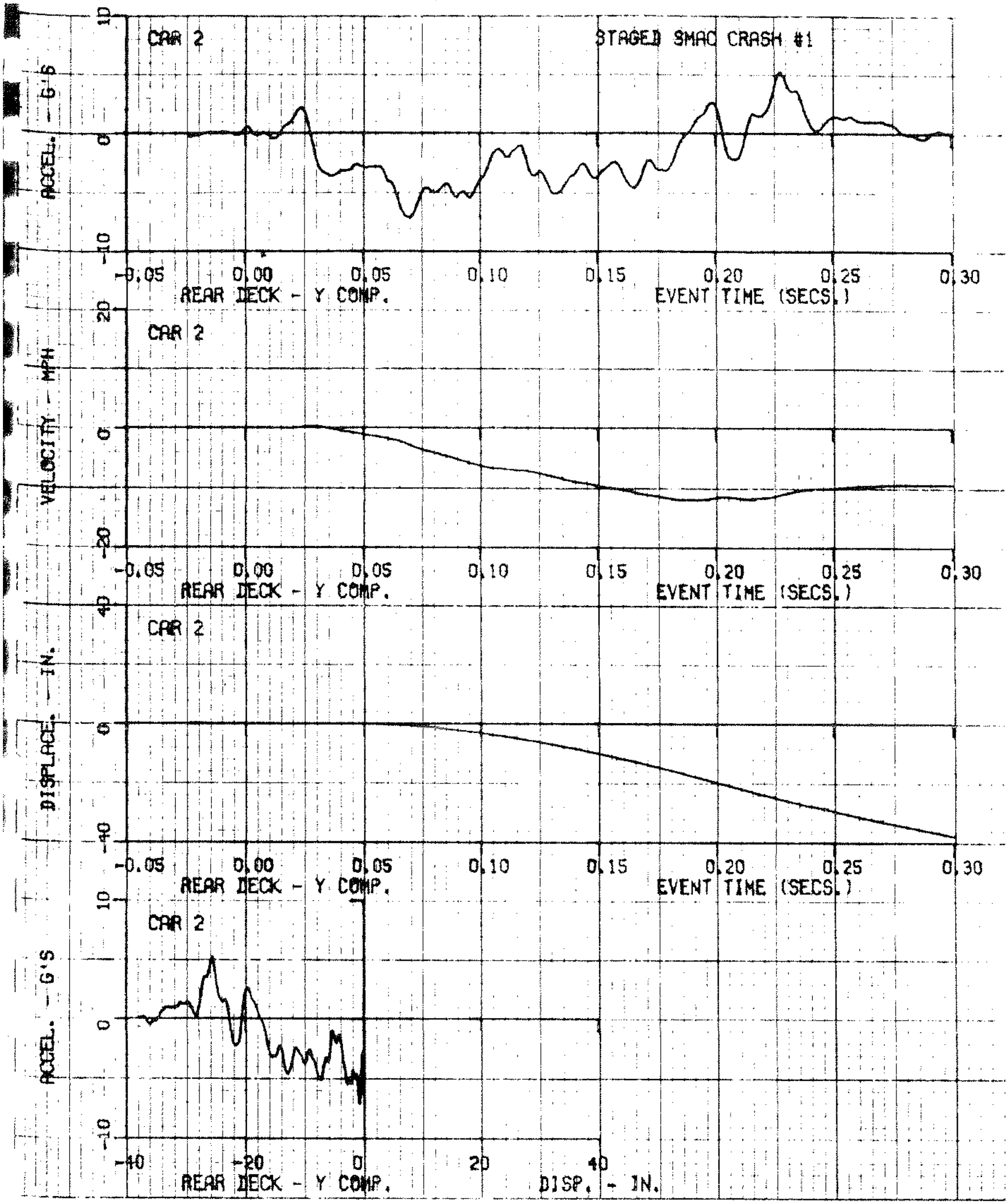

CAR 2
STAGE3 SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
10
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0 20 40 60 80
FIREWALL X COMPONENT
DISP. - IN.

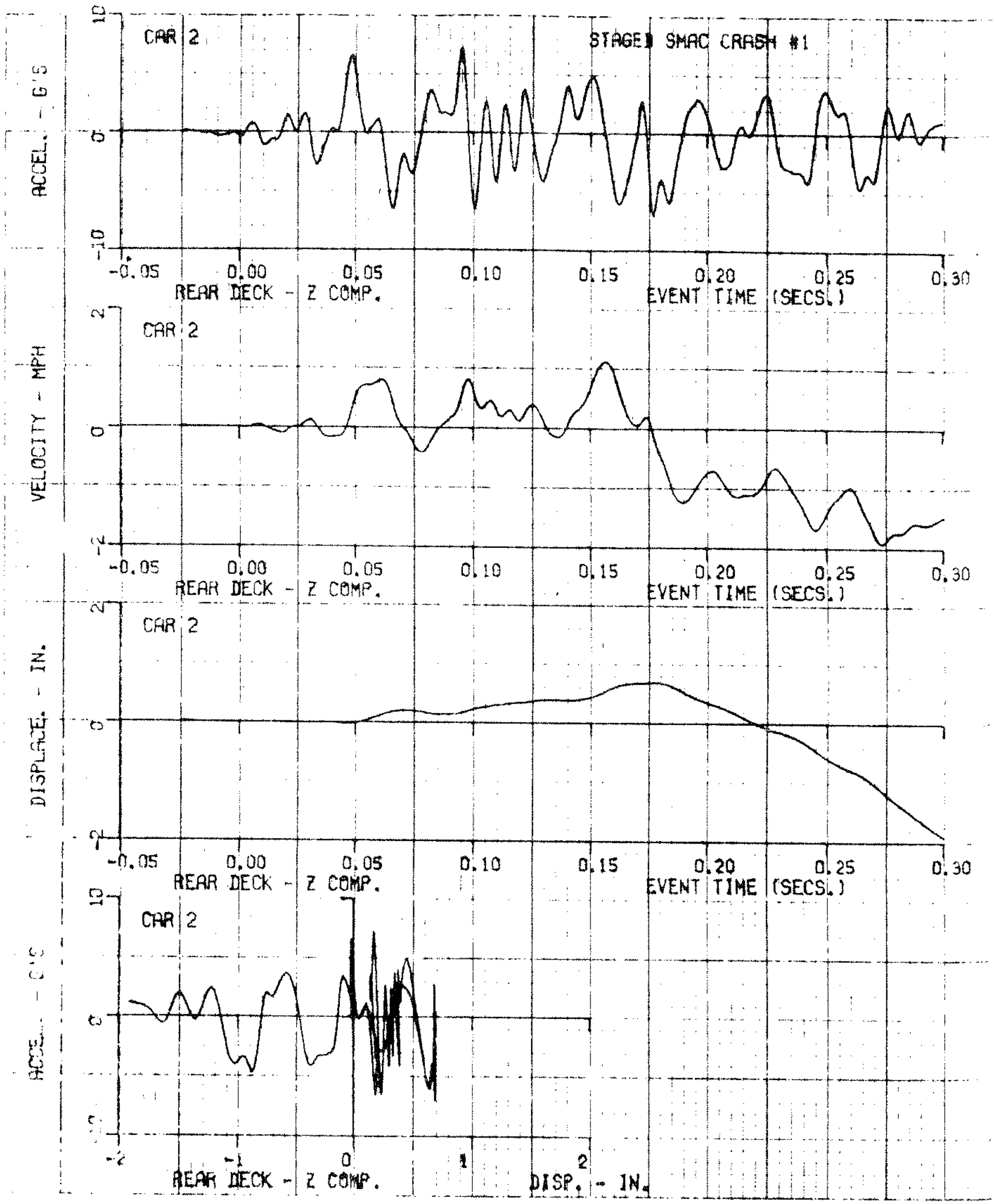

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
0
-10
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-40
-80
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-60
-40
-20
0
20
FIREWALL - Y COMPONENT
DISP. - IN.


STAGED SMAC CRASH #1
CAR 2
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
-10
-6
-4
-2
0
2
FIREWALL - Z COMPONENT
DISP. - IN.

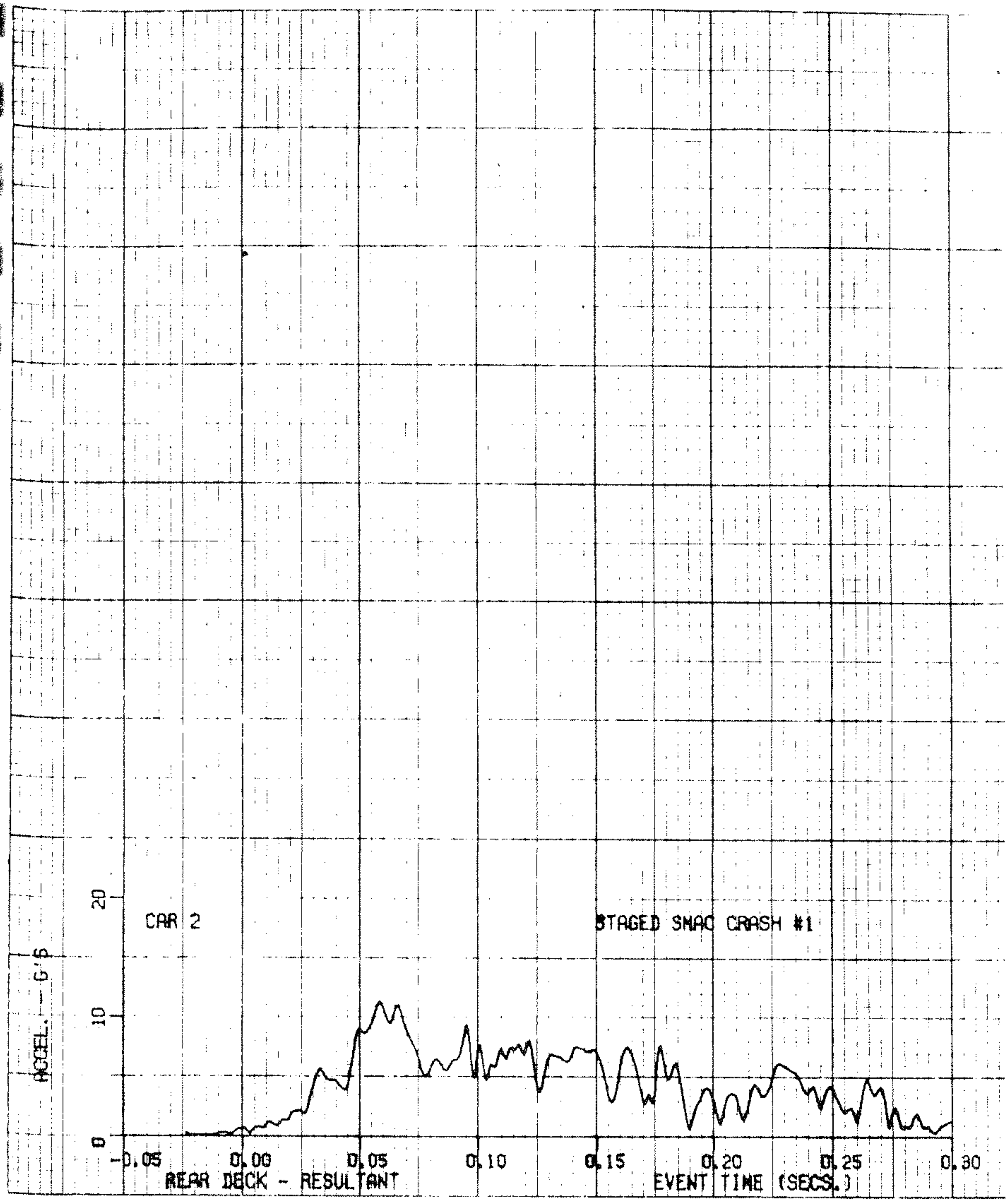

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
0
10
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)

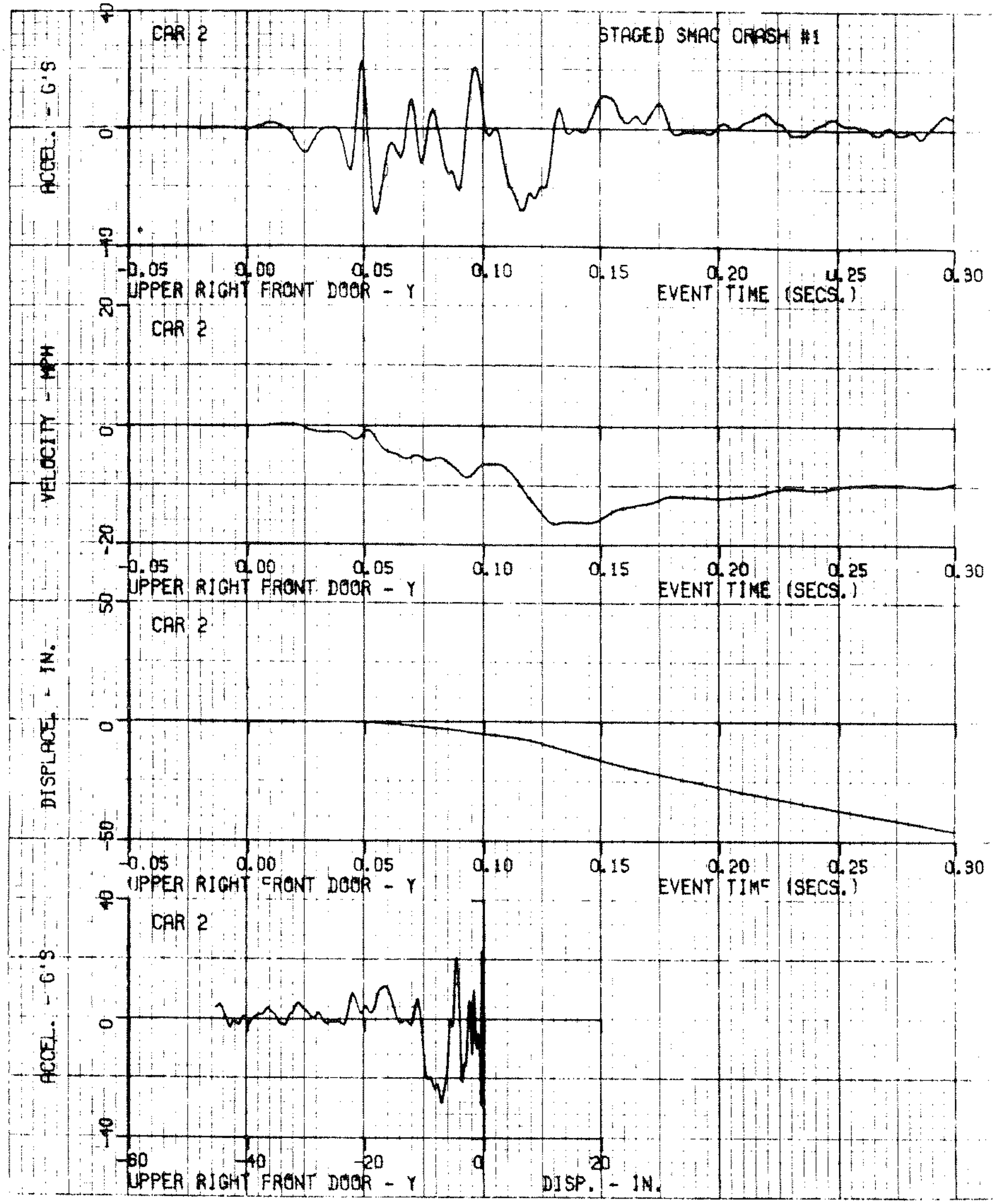

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
REAR DECK - X COMP.
DISP. - IN.

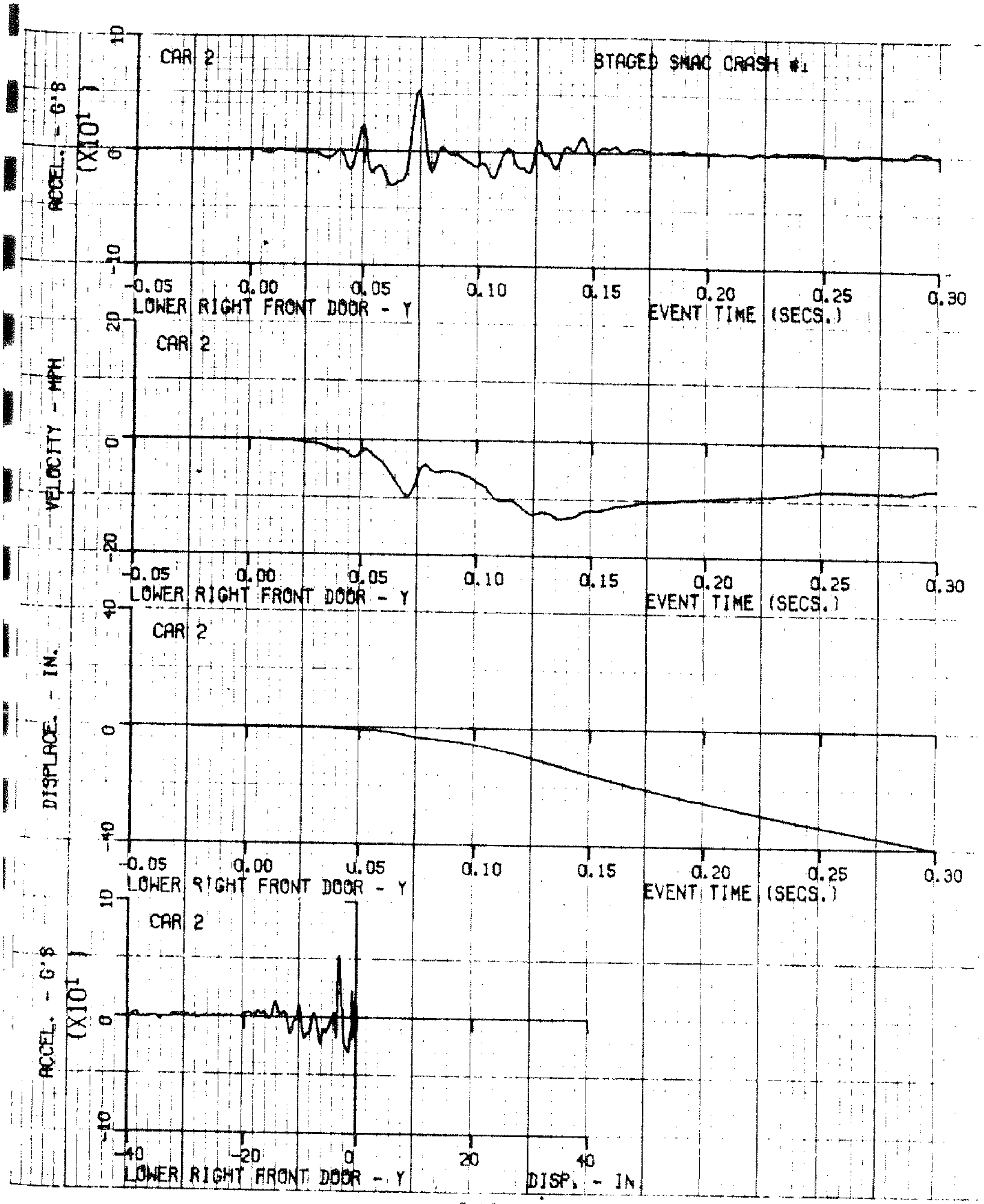

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
-10
-40
-20
0
20
40
REAR DECK - Y COMP.
DISP. - IN.

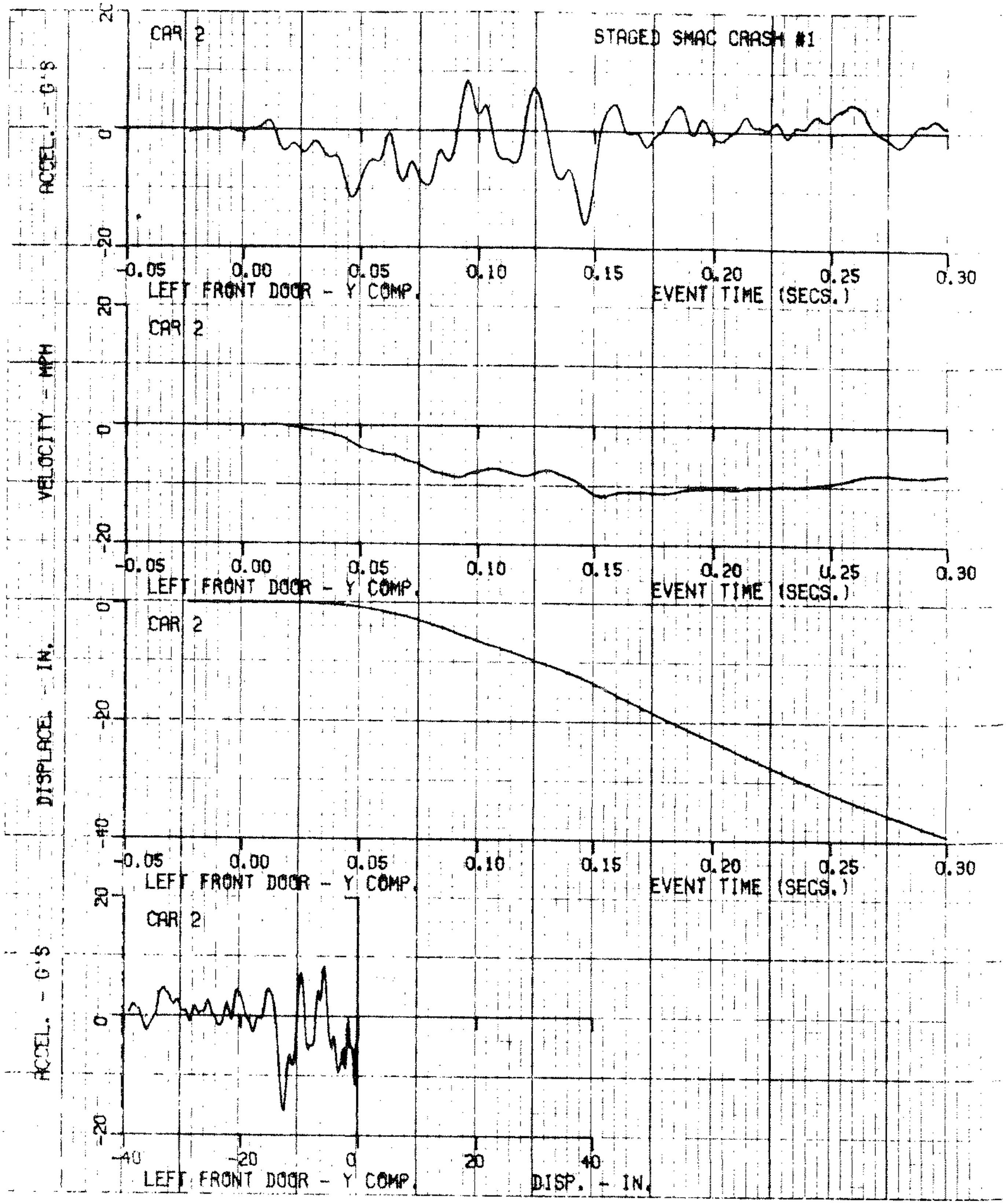

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
10
0
-2
-1
0
1
2
REAR DECK - Z COMP.
DISP. - IN.

ZQ-6057-V-4


CAR 2
STAGED SNAC CRASH #1
ACCEL. -- G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
UPPER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
UPPER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
UPPER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-60
-40
-20
0
20
UPPER RIGHT FRONT DOOR - Y
DISP. - IN.


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S (X10¹)
LOWER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
LOWER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
LOWER RIGHT FRONT DOOR - Y
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
LOWER RIGHT FRONT DOOR - Y
DISP. - IN.



CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT DOOR - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT DOOR - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-20
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT DOOR - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-40
-20
0
20
40
LEFT FRONT DOOR - Y COMP.
DISP. - IN.

TABLE 7-7

DUMMY INJURY CRITERIA VALUES

CAR 2 - STRUCK VEHICLE - TEST NO. 1

1974 FORD PINTO

	MAXIMUM ACCELERATION ("G") *											
	HEAD				CHEST				PELVIS			
	X *	Y	Z	R	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	-26	-4.3	25	55	-6.5	-20	74			-8.8		
DUMMY (2)	-24.8	20	20	60	-5.5	-16	18.4			-20.8		
DUMMY (3)												
DUMMY (4)												

	MAXIMUM FORCE-FEMUR LOAD (LBS)		DUMMY LOCATION
	RIGHT FEMUR	LEFT FEMUR	
DUMMY (1)	475	90	Left Front Passenger Dr.
DUMMY (2)	9	24	Right Front Passenger
DUMMY (3)			
DUMMY (4)			

	MAXIMUM FORCE-SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)			
DUMMY (2)			
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX	
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2	HEAD	CHEST
DUMMY (1)	143	.148	.225	20.4	320	1700
DUMMY (2)	89.2	.107	.182	17.0	280	63
DUMMY (3)						
DUMMY (4)						

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

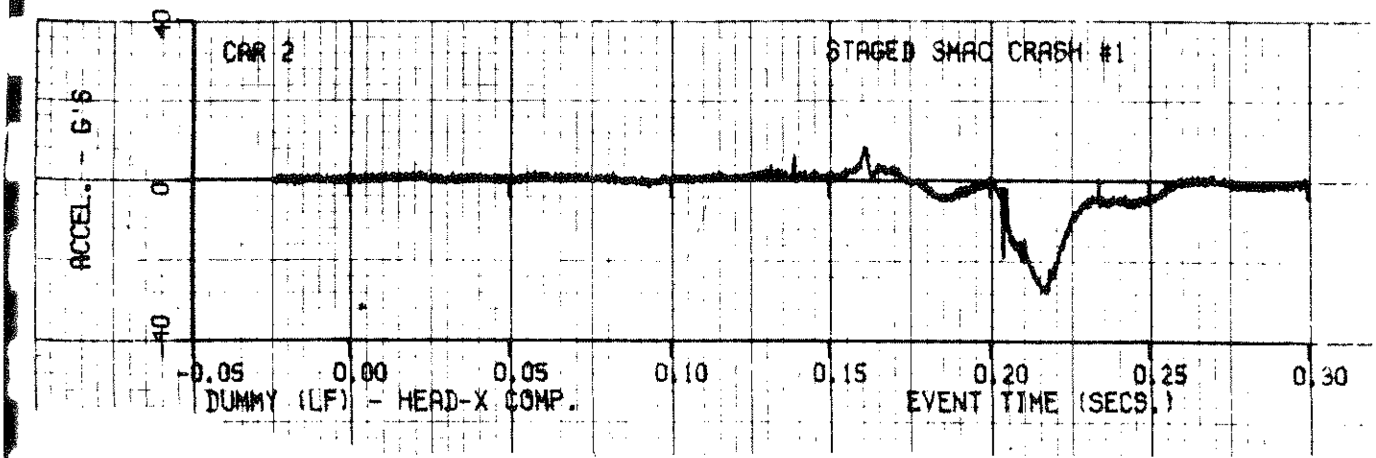
**AS DEFINED IN FMVSS NO. 208

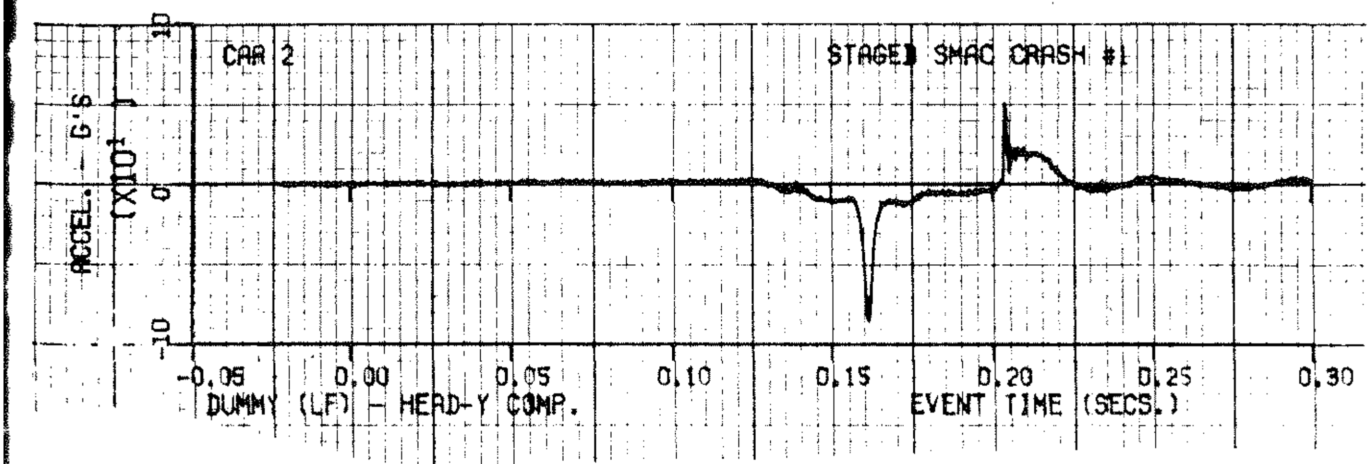
RICSAC TEST NO. 1

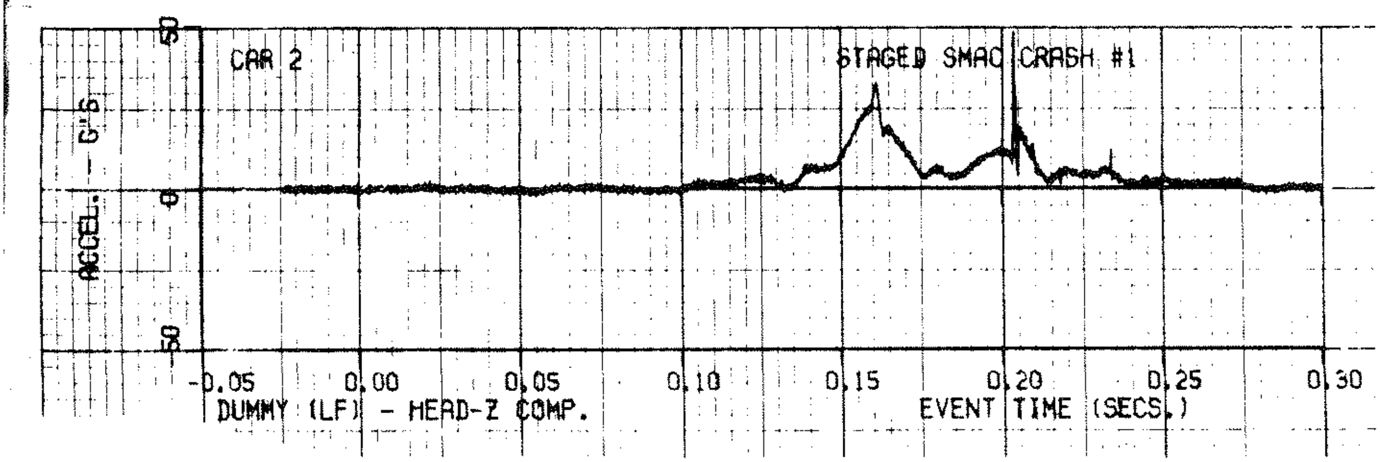
DUMMY DATA

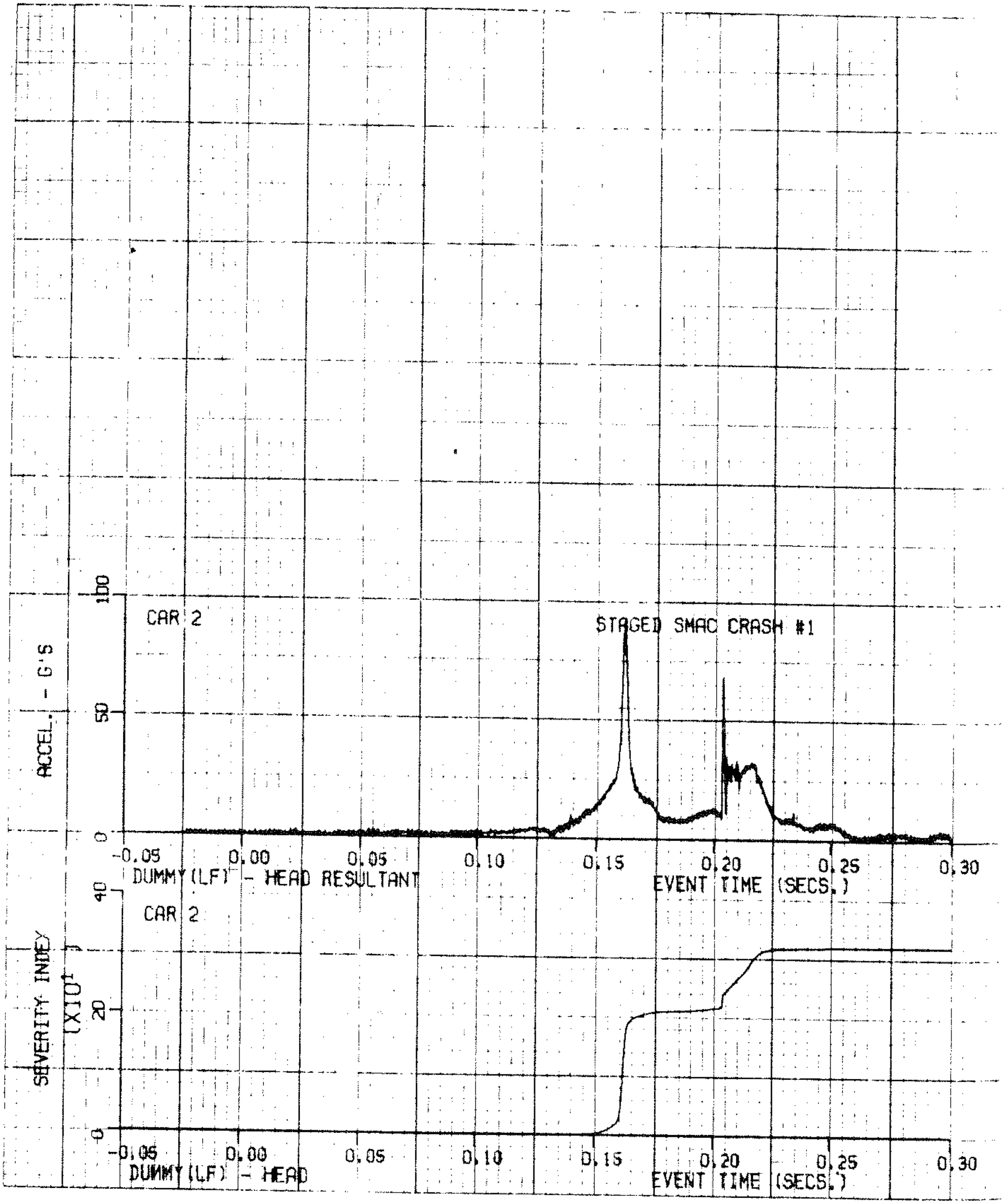
CAR NO. 2 PINTO

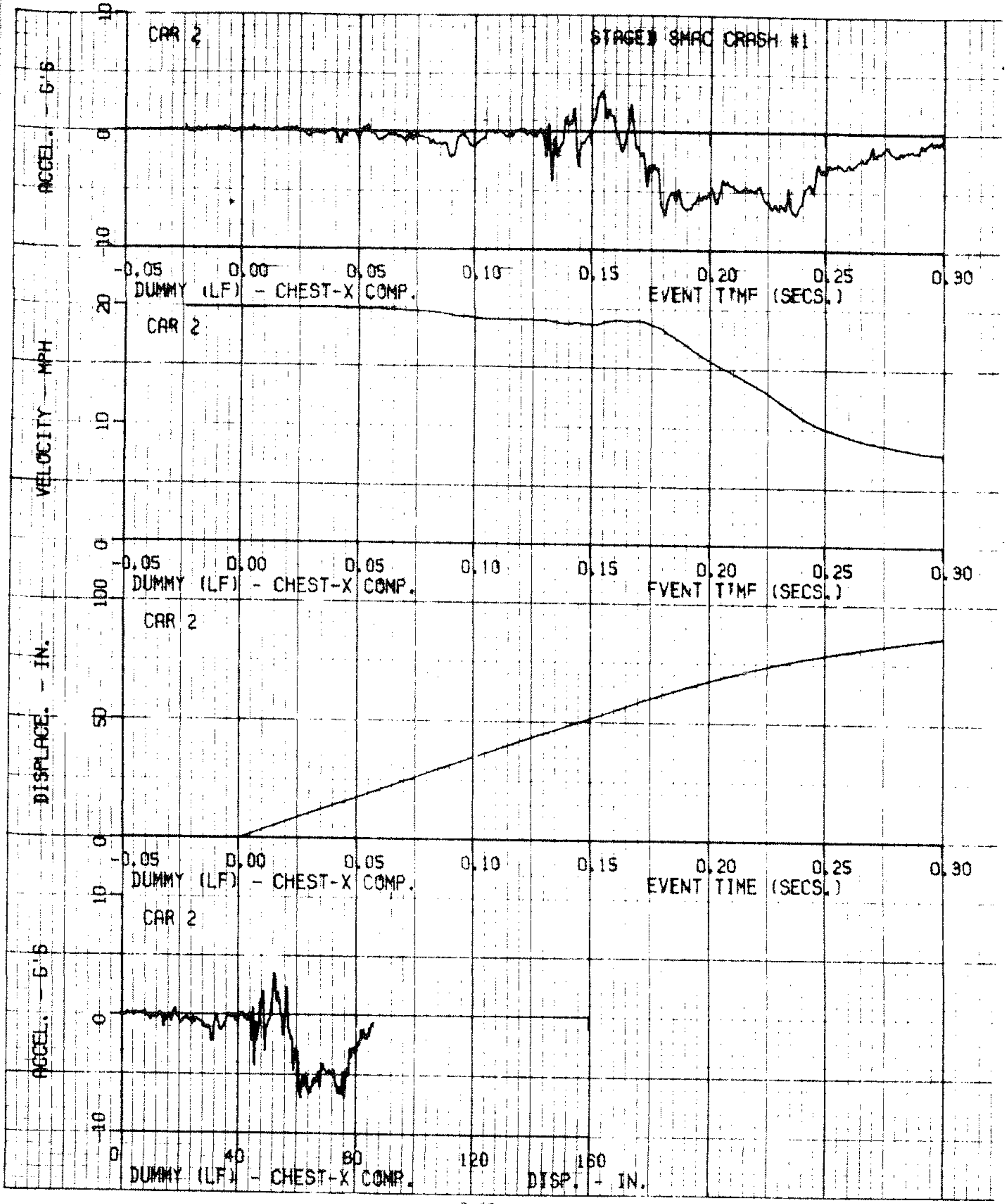
DATA PLOTS		FILTER CLASS
HEAD ACCELERATION	X,Y,X	1000
HEAD RESULTANT		
HEAD SEVERITY INDEX		
CHEST ACCELERATION	X,Y,Z	180
CHEST RESULTANT		
CHEST VELOCITY	X,Y,Z	
CHEST DISPLACEMENT	X,Y,Z	
CHEST SEVERITY INDEX		
PELVIC ACCELERATION	Y	180
PELVIC VELOCITY	Y	
PELVIC DISPLACEMENT	Y	
FEMUR LOADS	L & R	600

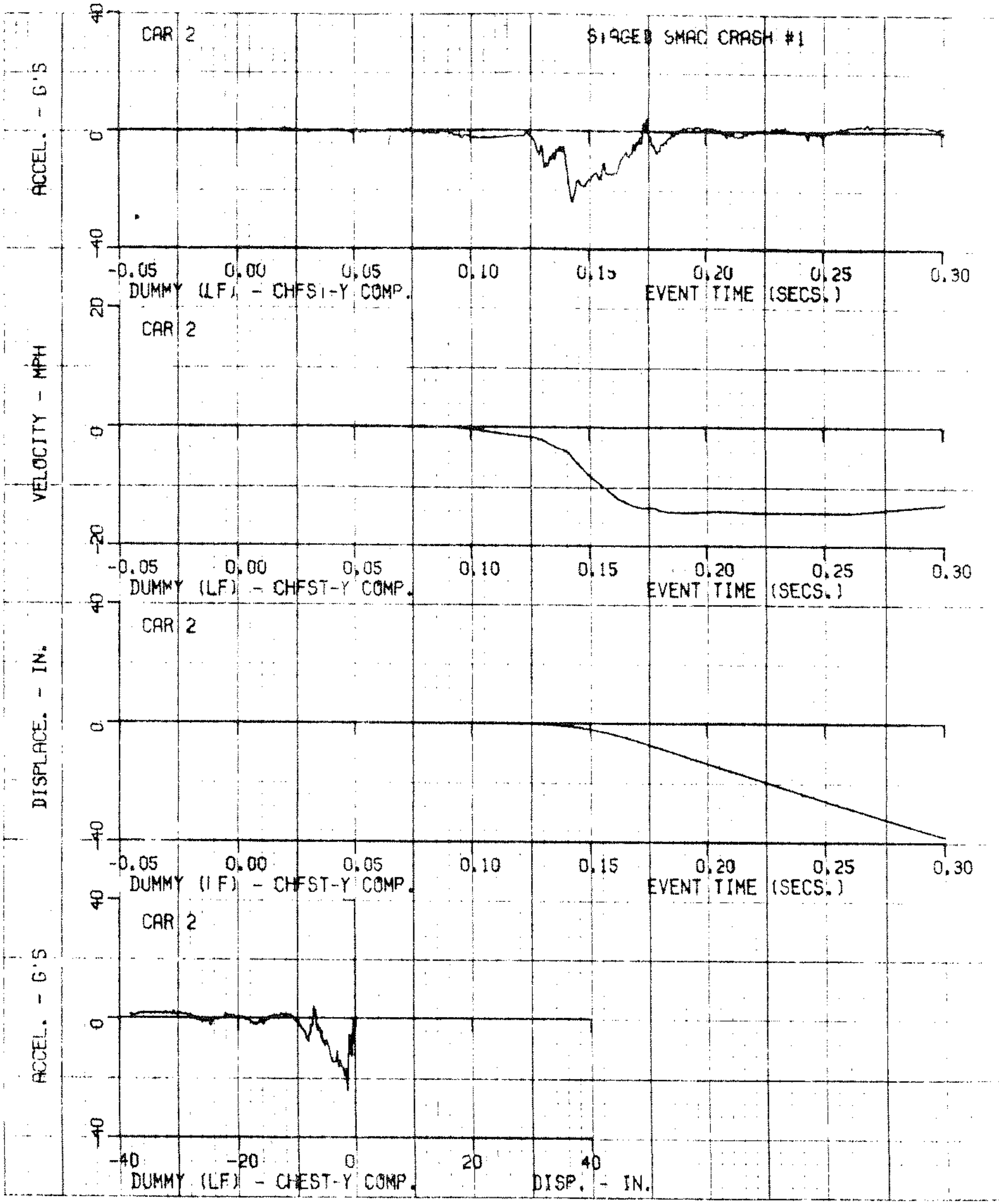

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)

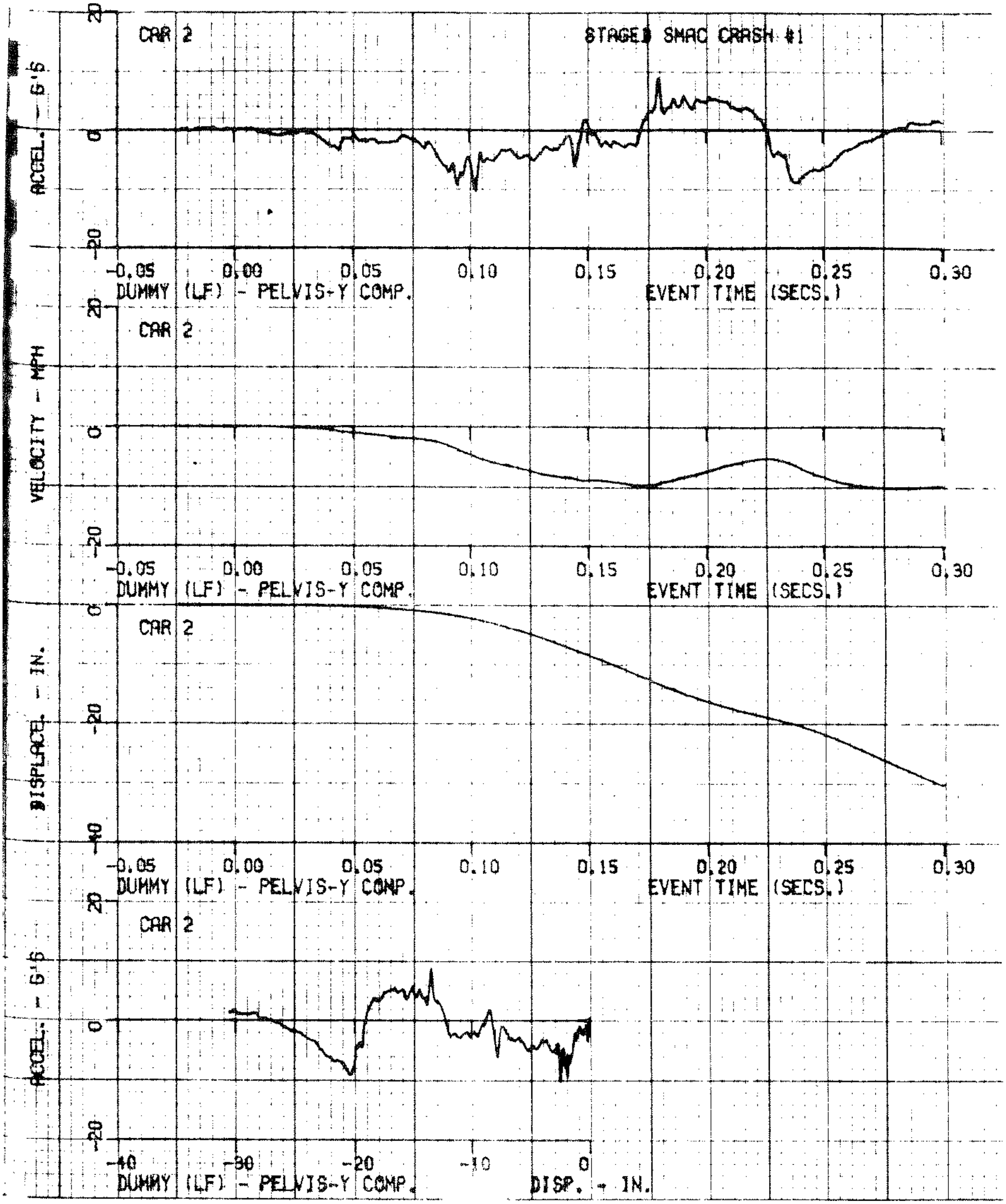

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
(X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)

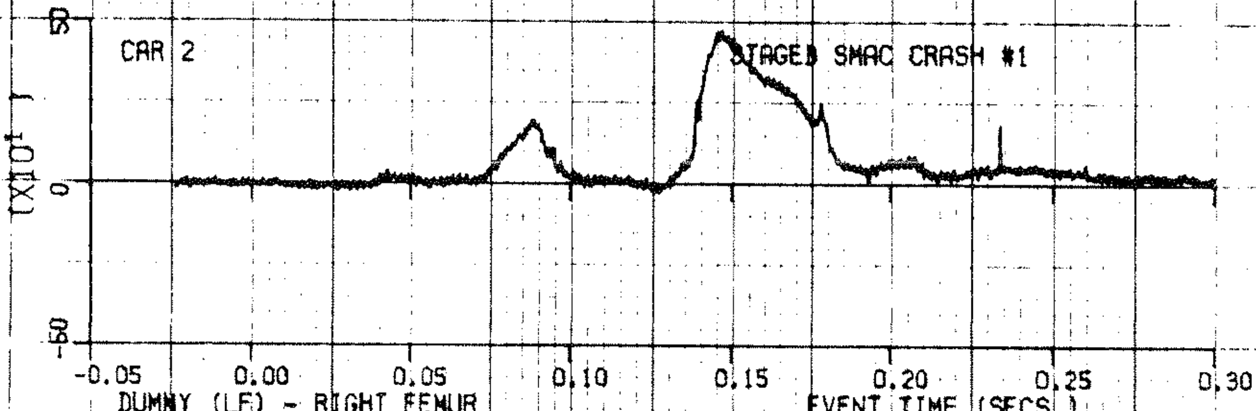

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
100
50
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - HEAD RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX (X10¹)
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - HEAD
EVENT TIME (SECS.)

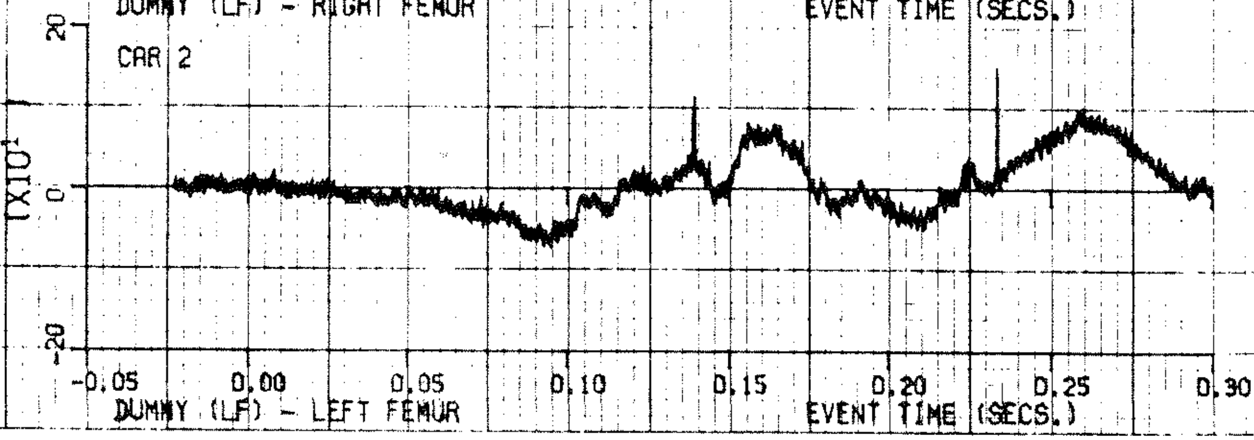

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
20
10
0
CAR 2
DISPLACE. - IN.
100
50
0
CAR 2
ACCEL. - G'S
CAR 2
0
40
80
120
160
DUMMY (LF) - CHEST-X COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-40
-20
0
20
40
DUMMY (LF) - CHEST-Y COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-20
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-40
-30
-20
-10
0
DUMMY (LF) - PELVIS-Y COMP.
DISP. - IN.

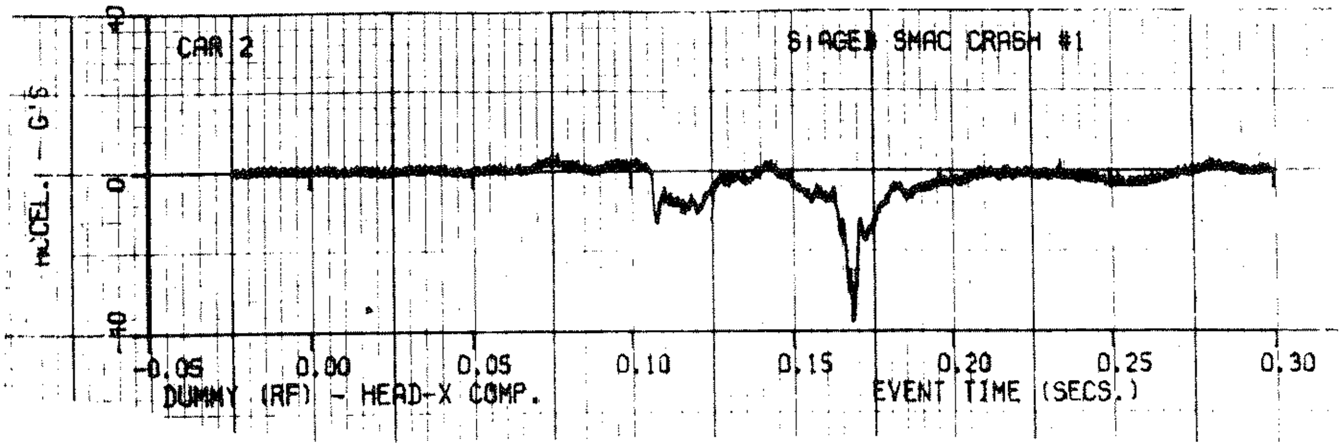


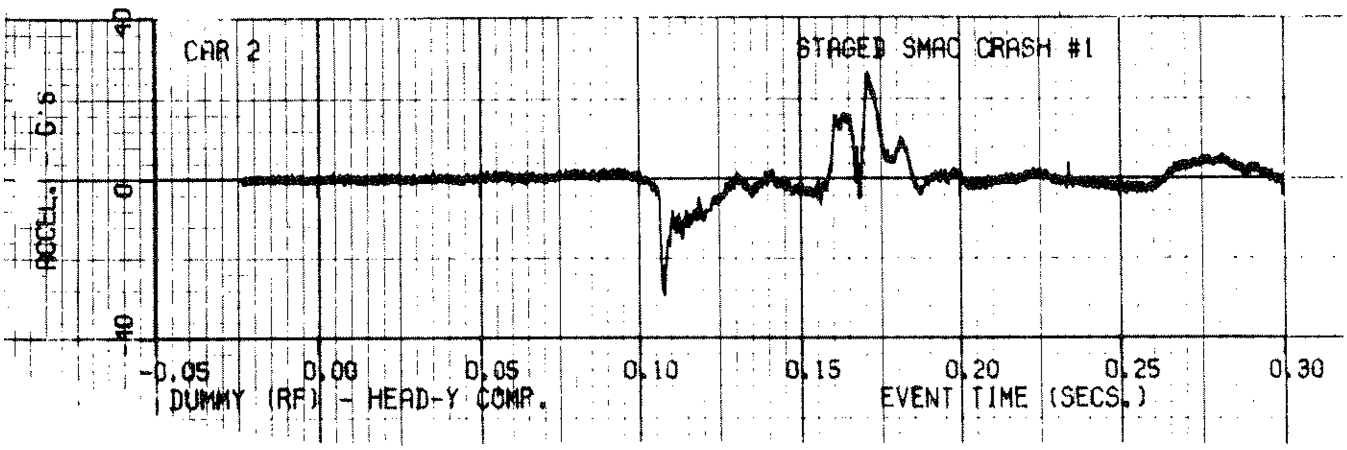
CAR 2
STAGED SMAC CRASH #1
LOAD L LBS
[X10^1]
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - RIGHT FEMUR
EVENT TIME (SECS.)

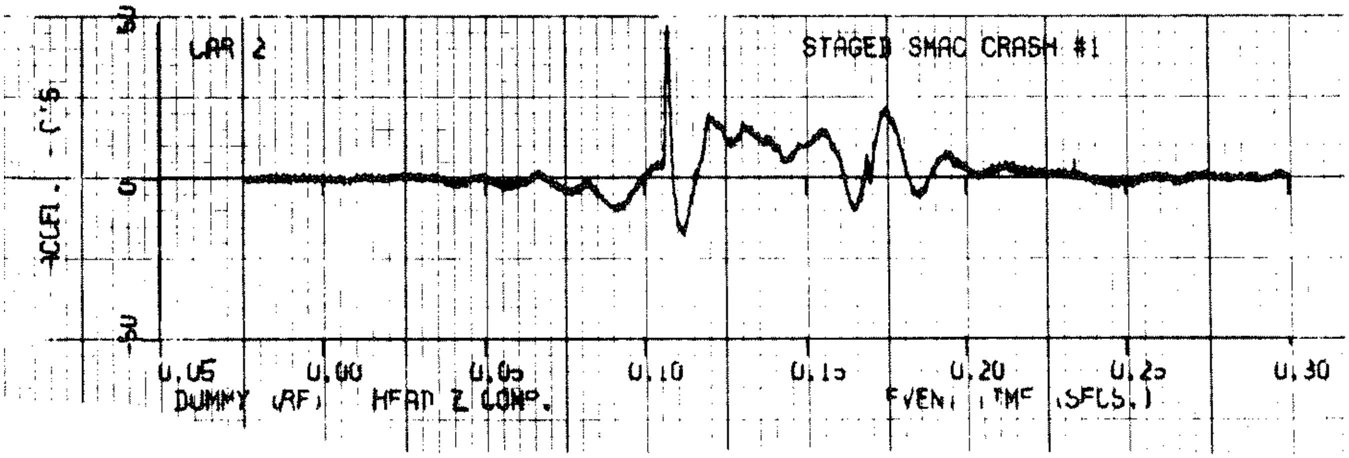


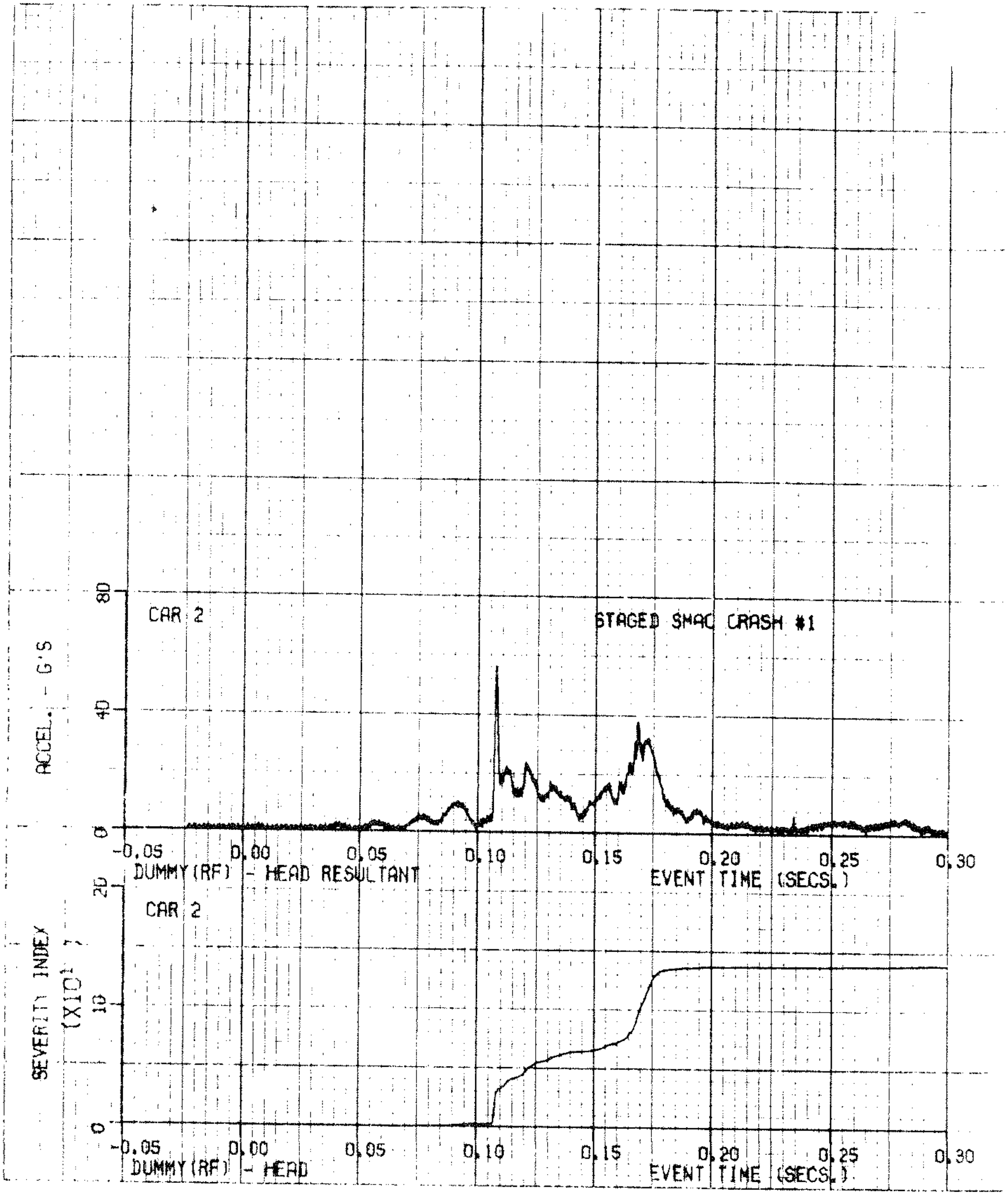
CAR 2
LOAD - LBS
[X10^1]
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - LEFT FEMUR
EVENT TIME (SECS.)

ZO 6057 V. 1


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Y COMP.
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #1
50
0
-50
0.10
0.20
0.30
DUMMY (RF)
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX (X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD
EVENT TIME (SECS.)

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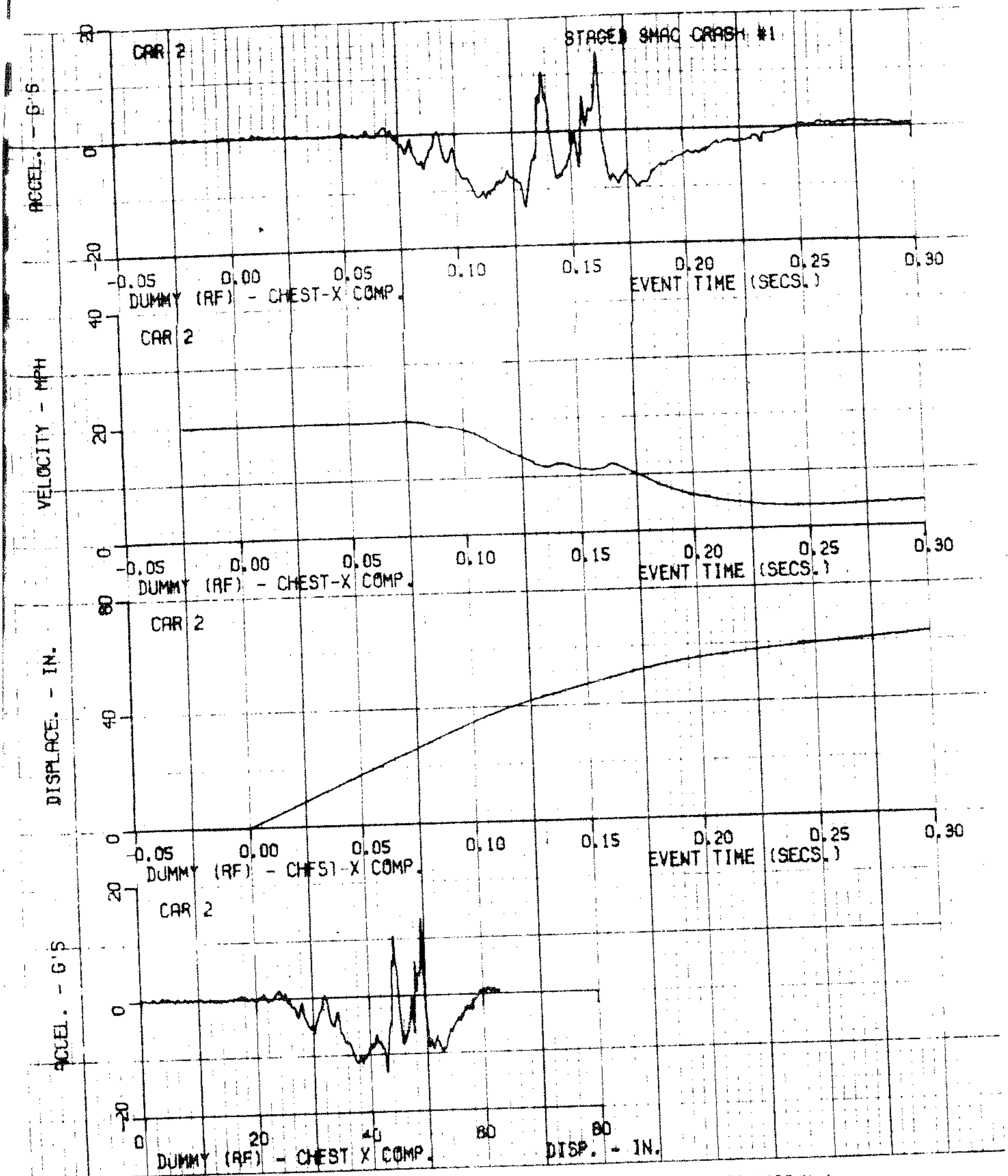
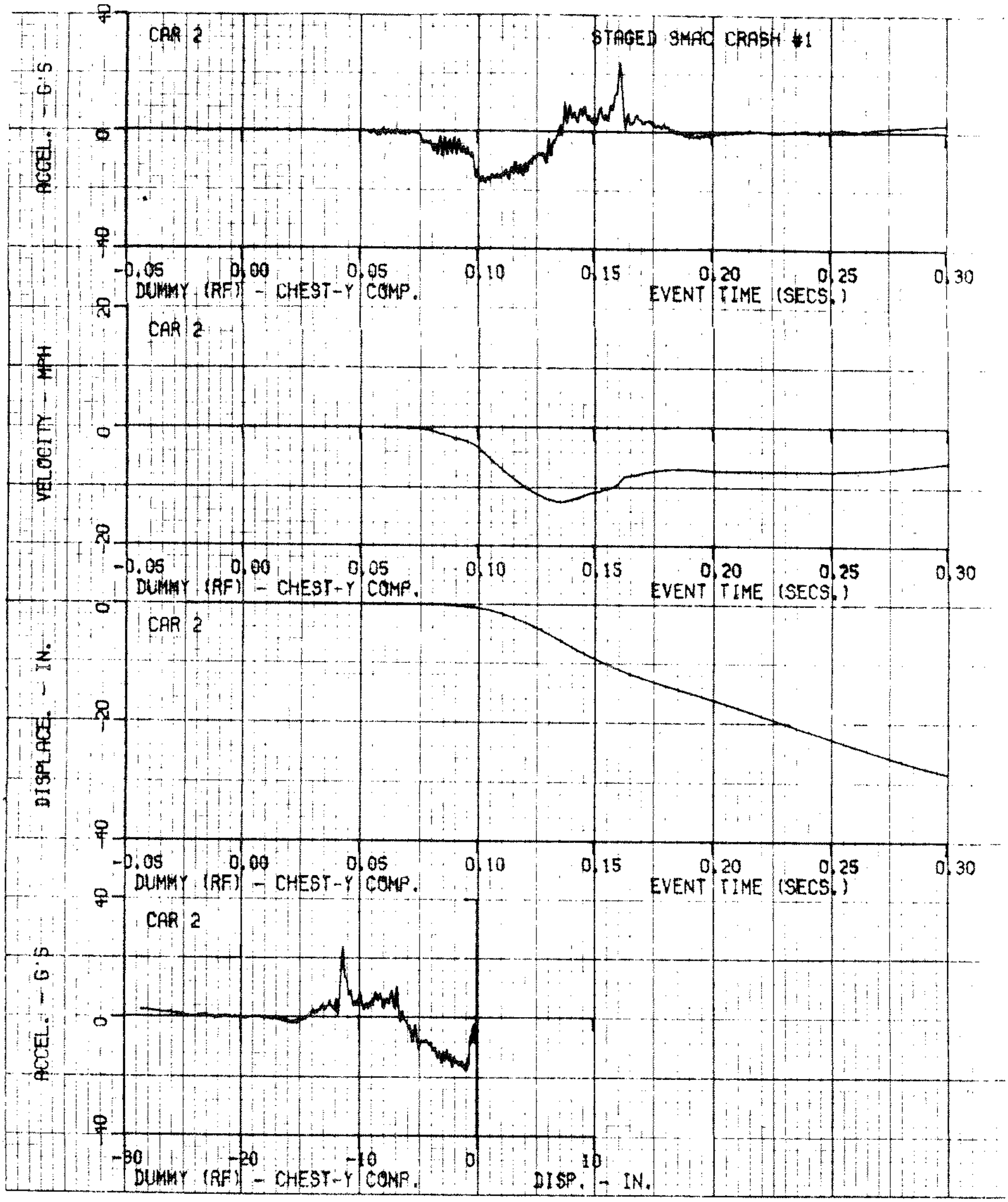
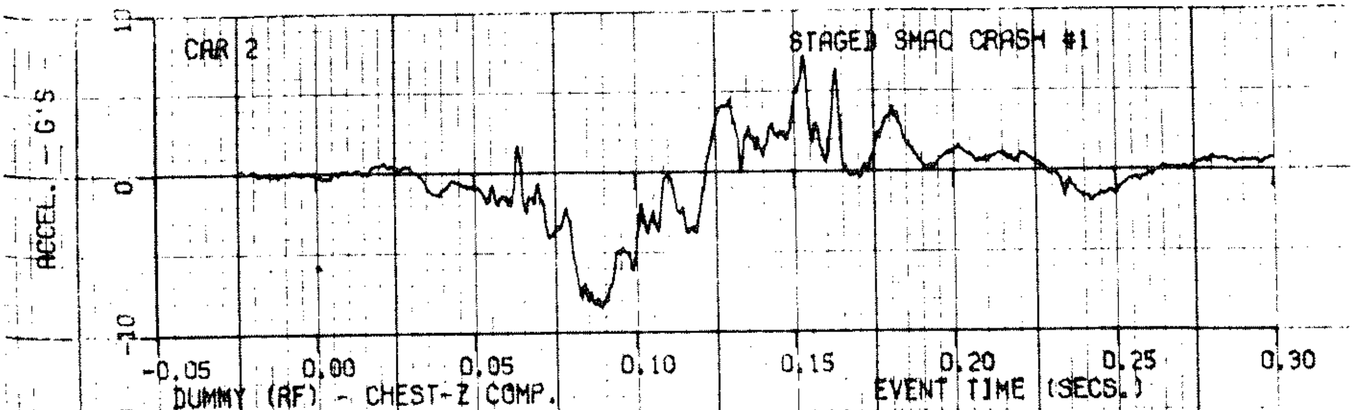
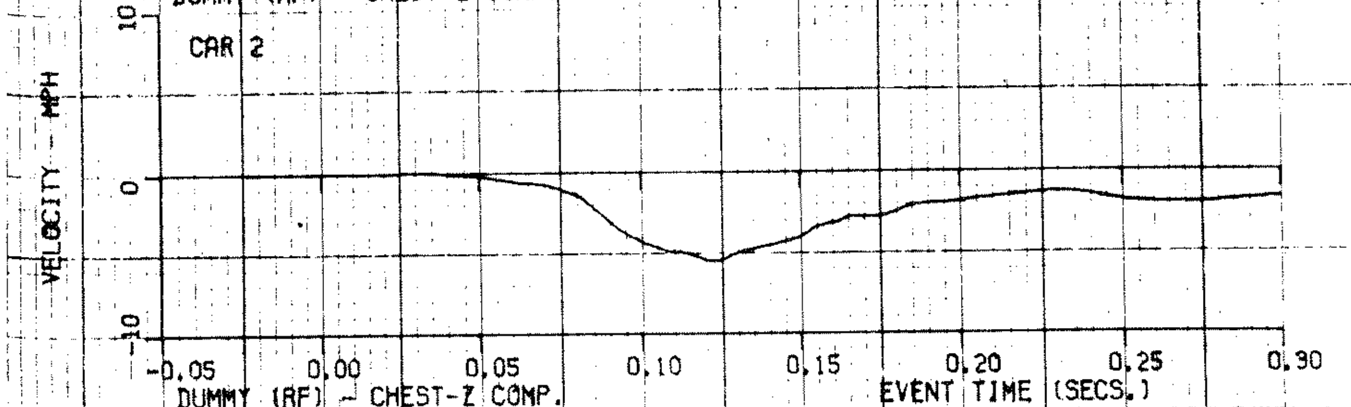
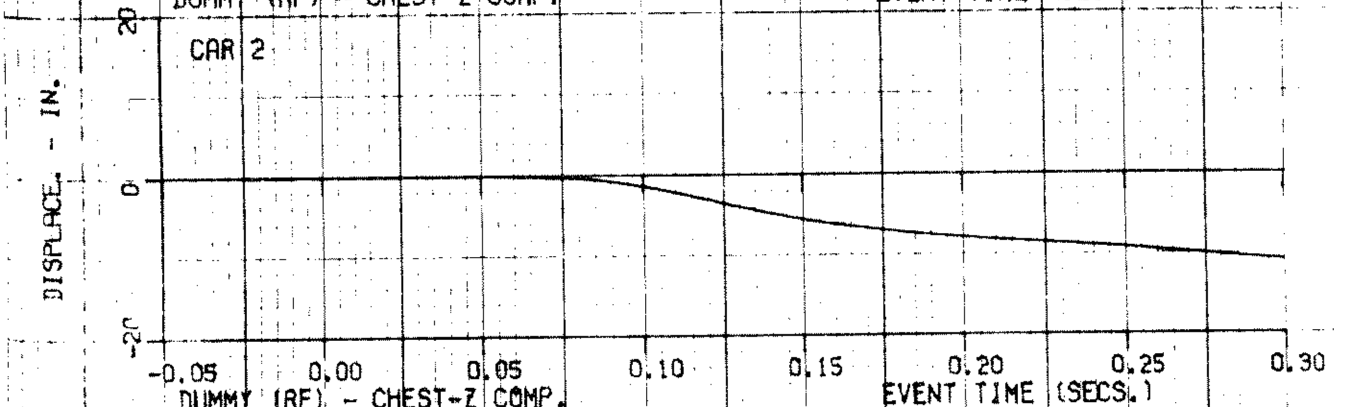
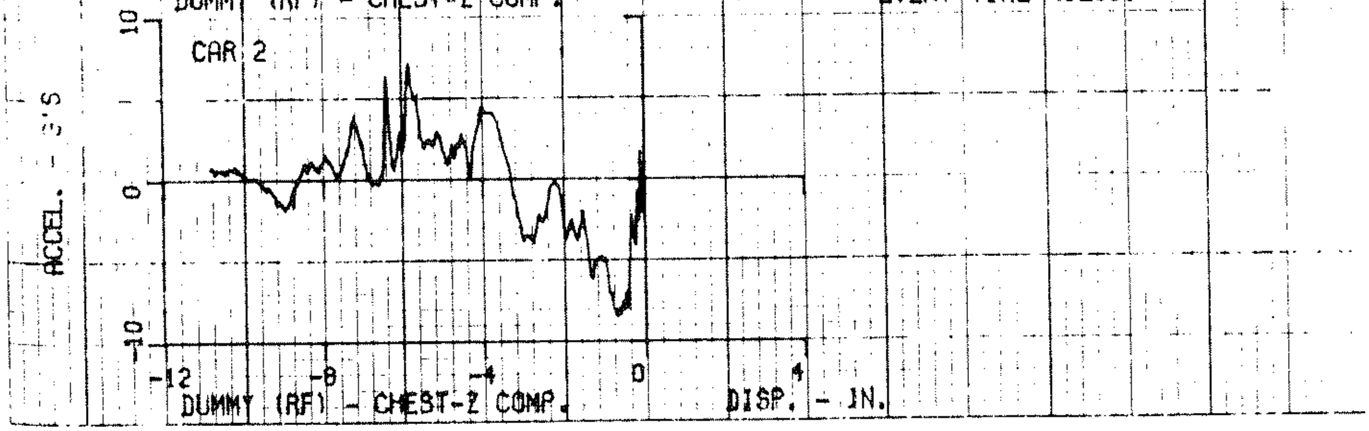

STAGED SMAC CRASH #1
CAR 2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
EVENT TIME (SECS.)
DUMMY (RF) - CHEST-X COMP.
CAR 2
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
EVENT TIME (SECS.)
DUMMY (RF) - CHEST-X COMP.
CAR 2
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
EVENT TIME (SECS.)
DUMMY (RF) - CHEST-X COMP.
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
DISP. - IN.
DUMMY (RF) - CHEST X COMP.

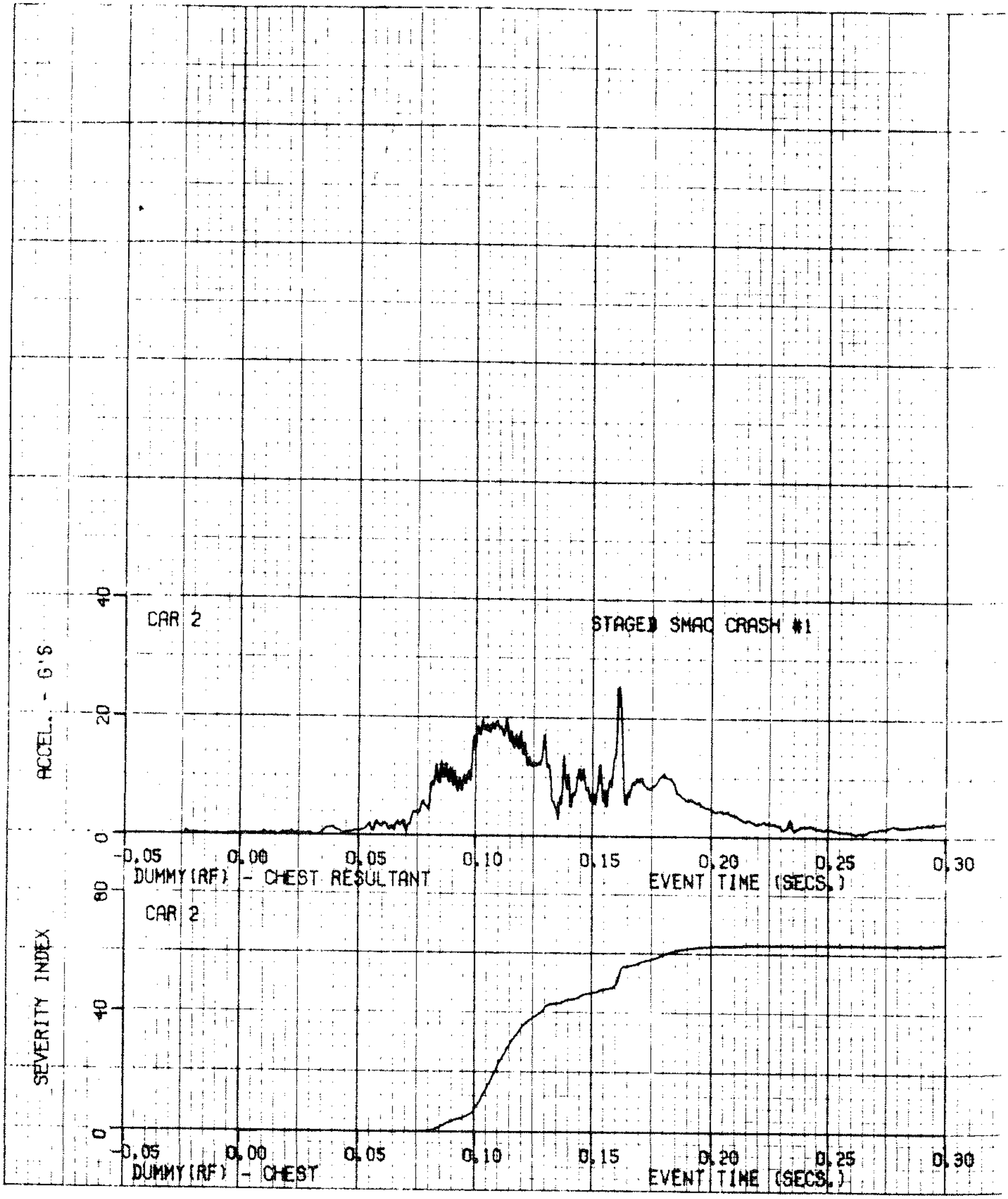

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.

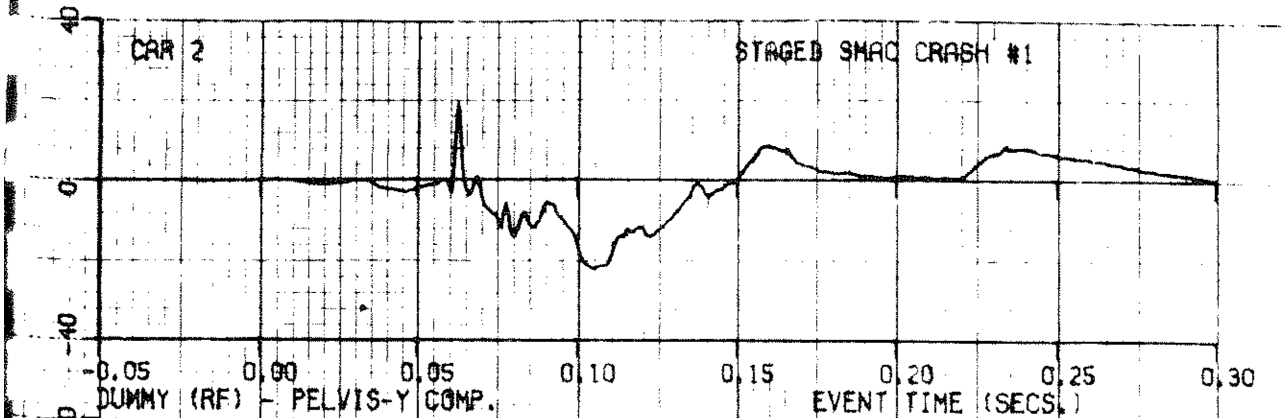

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)


CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)

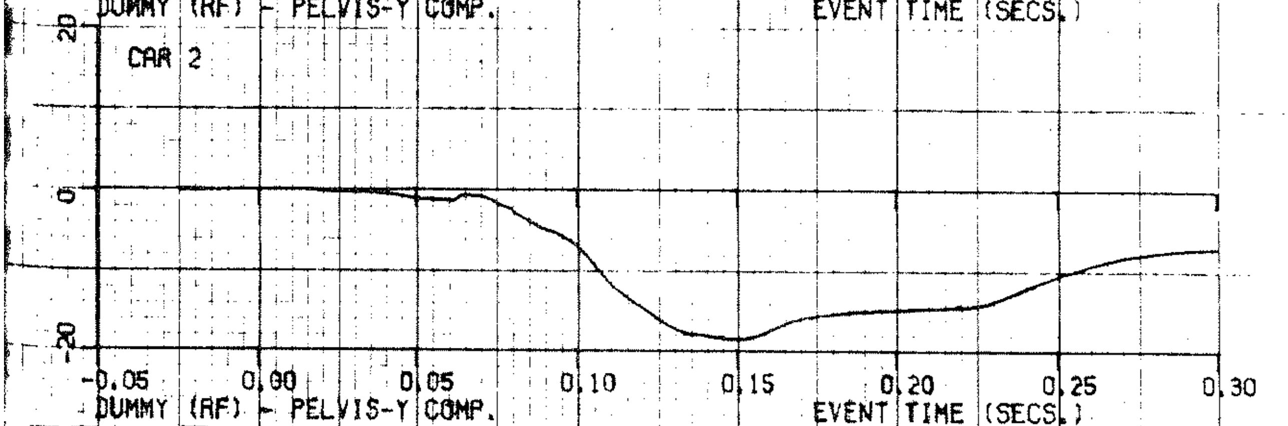

CAR 2
DISPLACE. - IN.
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)


CAR 2
ACCEL. - G'S
10
0
-10
-12
-8
-4
0
4
DUMMY (RF) - CHEST-Z COMP.
DISP. - IN.

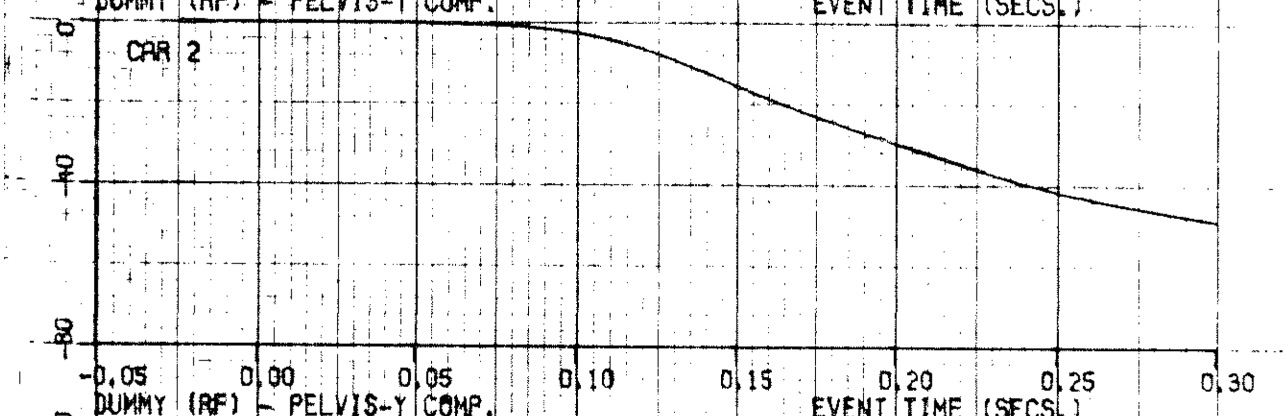

CAR 2
STAGED SMAC CRASH #1
ACCEL. - G'S
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - CHEST RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - CHEST
EVENT TIME (SECS.)



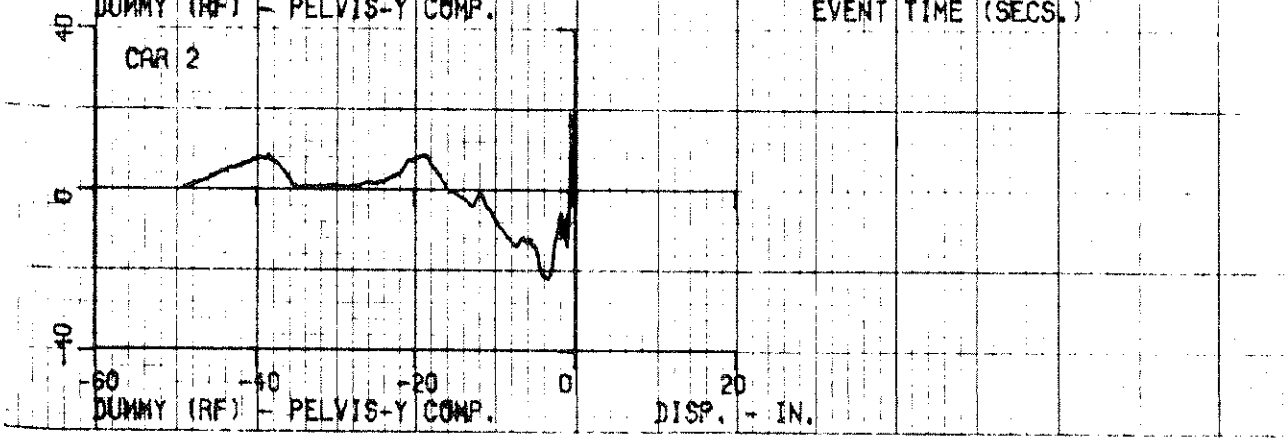
CAR 2
STAGED SMAC CRASH #1
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-Y COMP.
EVENT TIME (SECS.)



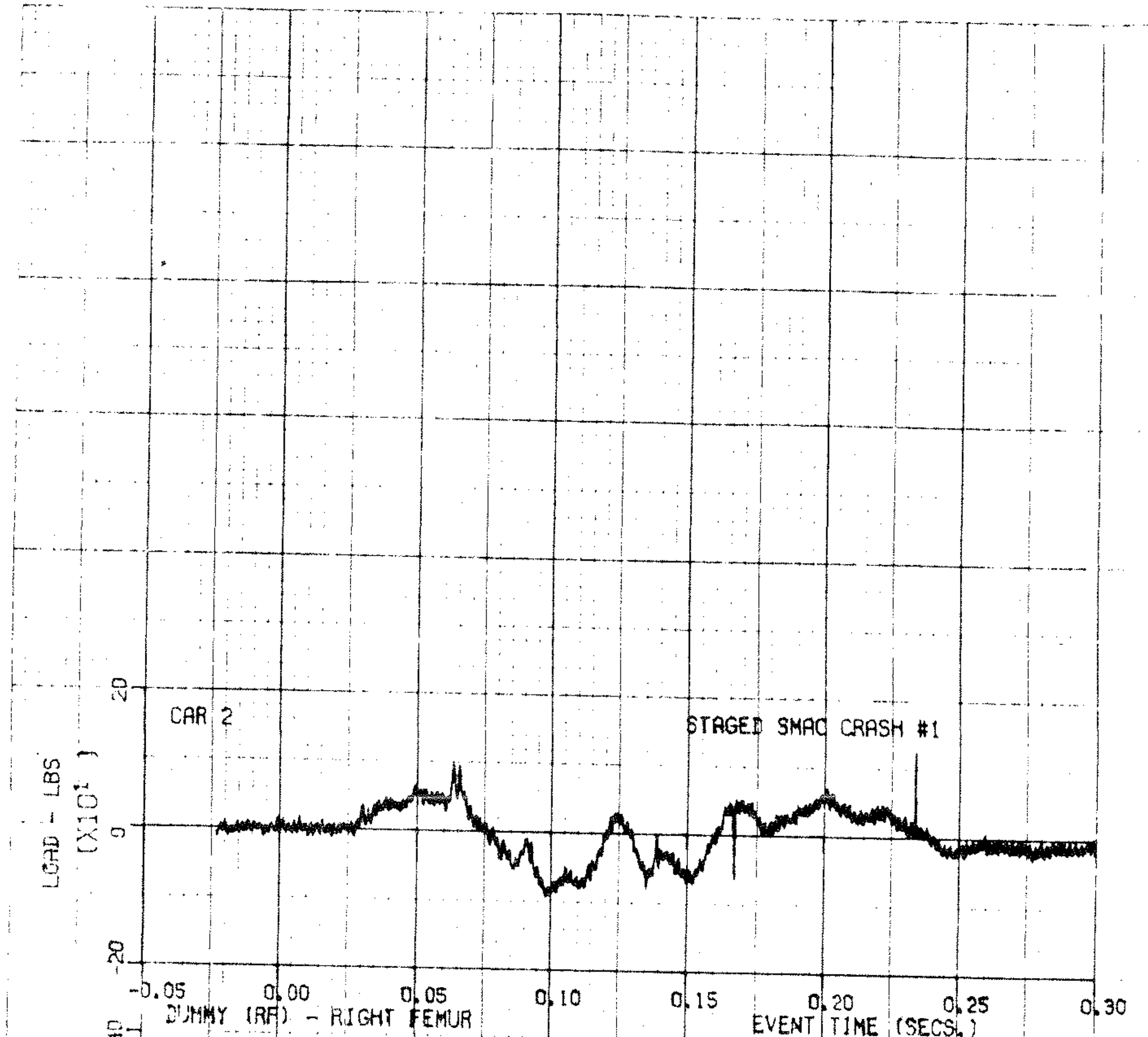
CAR 2
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-Y COMP.
EVENT TIME (SECS.)

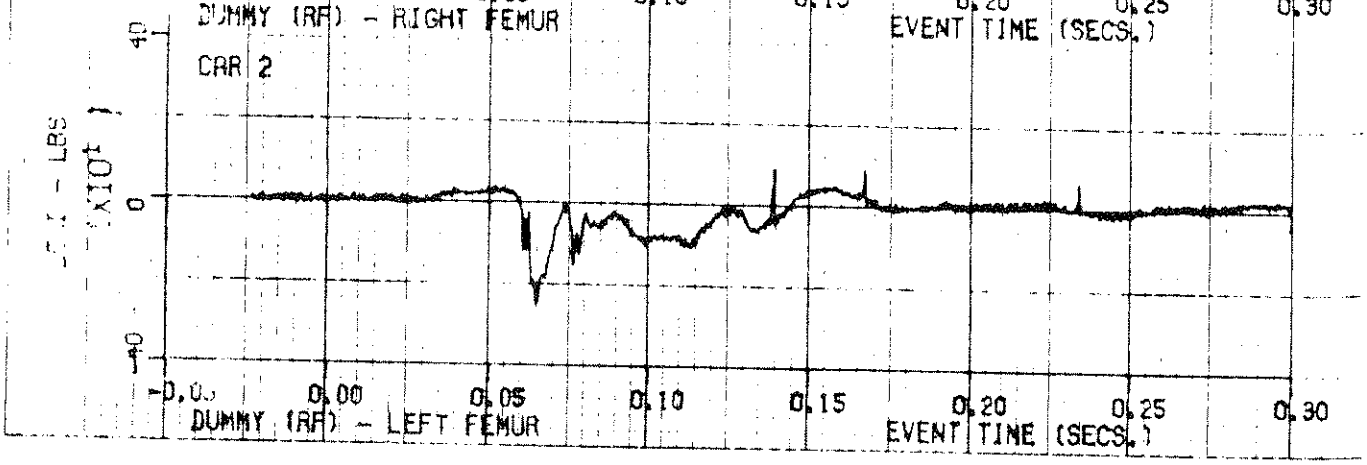


CAR 2
0
-40
-80
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-Y COMP.
EVENT TIME (SECS.)



CAR 2
40
0
-40
-60
-40
-20
0
20
DUMMY (RF) - PELVIS-Y COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #1
LOAD - LBS
(X10¹)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - RIGHT FEMUR
EVENT TIME (SECS.)


CAR 2
- LBS
(X10¹)
40
0
-40
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - LEFT FEMUR
EVENT TIME (SECS.)

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TEST NO. 2

RICSAC STAGED COLLISION

FRONT-TO-SIDE

OBLIQUE - OFFSET

CHEVELLE/PINTO

VELOCITY 31.5 MPH

8.0 RICSAC STAGED COLLISION - TEST NO. 2

EXPERIMENTAL RESULTS

Test Description

This staged collision involved a 1974 Chevrolet Chevelle Malibu (V-1) striking a 1974 Ford Pinto (V-2) on the right side (front section) at an oblique angle of 60 degrees as shown in Figure 8-1. The impact velocity of both vehicles was 31.5 mph. The vehicle test weights were 4710 and 3260 pounds for the Chevelle and Pinto, respectively. Each vehicle had two Part 572 test dummies (50 percentile) seated in the front seat. The dummies in the Pinto were instrumented according to FMVSS 208 and were unrestrained. In the Chevelle the dummies were uninstrumented and were restrained with seat belts.

The Chevelle was equipped with automatic transmission, power steering and power brakes. The Pinto had manual transmission, steering and standard brakes. The accident was staged with both transmissions in drive position, brakes off and the engine not running. During the collision no steering control inputs or vehicle braking was applied. The roadway was dry with skid resistance value of 87.

Approximately one car length before impact the vehicle tow cable was released and the vehicle guide rail was terminated. At this point in time and during the collision both vehicles are free bodies with no constraints except the normal collision forces and reactions encountered in this type of car-to-car collision. During the collision event no observed tow cable or instrumentation cable interference with the moving vehicles was noted.

Because the extensive compartment intrusion by the Chevelle major roof deformation occurred on the Pinto caused the roof mounted cameras to change orientation, thereby reducing onboard camera coverage of the dummy kinematics.

ACCIDENT SCHEMATIC

VEHICLES:

No. 1 - 1974 CHEVROLET CHEVELLE MALIBU
No. 2 - 1974 FORD PINTO

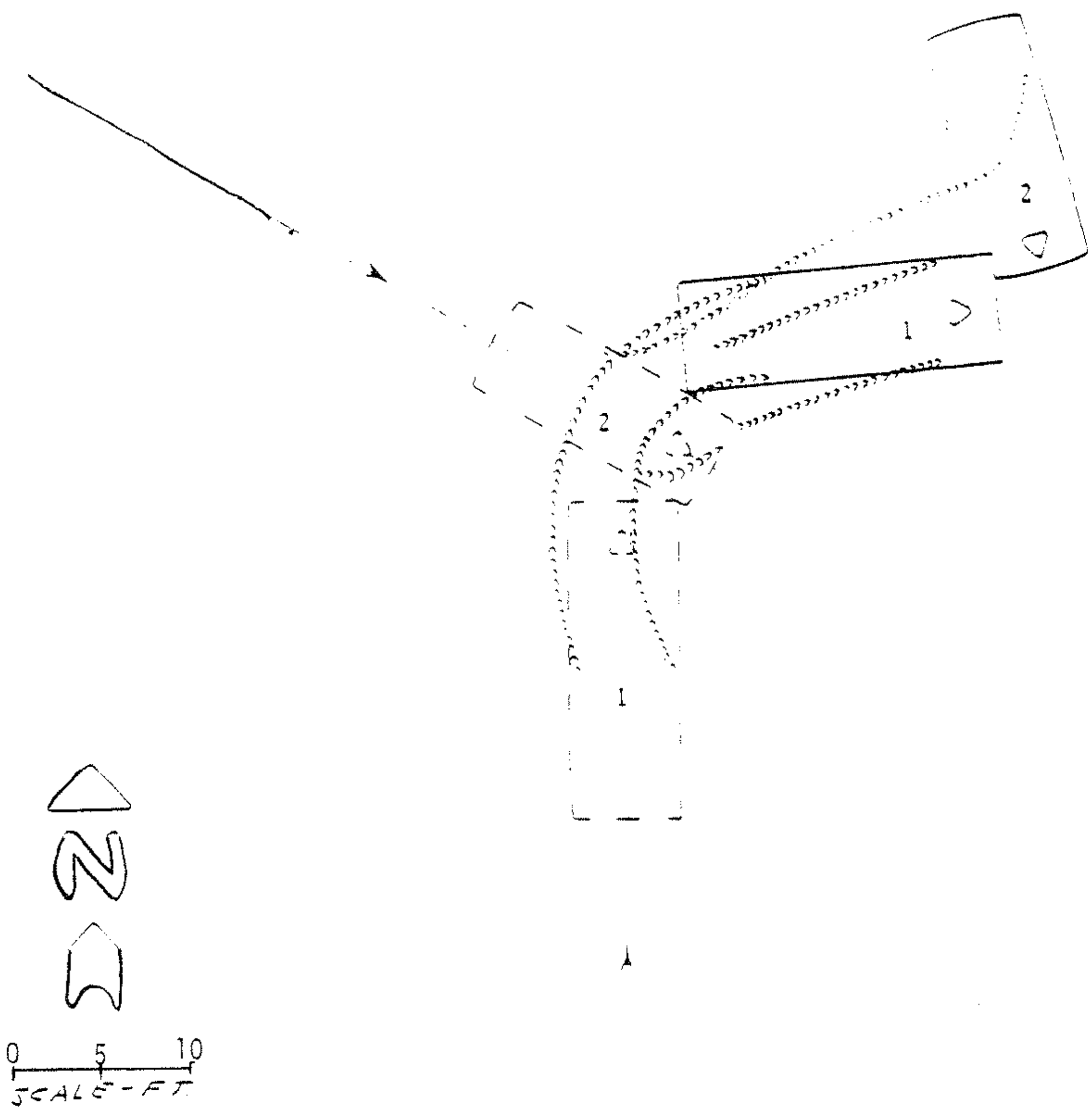


Figure 8-1 TEST NO. 2 - RICSAC ACCIDENT SCHEMATIC

CRASH TEST SUMMARY

TEST NO. 2 PROJECT RICSAC

DATE 11/18/77 TIME 12:50 TEMP. 38°F

TEST CONDITION Side Oblique Offset Frontal/Side 60°F

VEHICLE NO. 1 1974 Chevrolet Chevelle

VEHICLE NO. 2 1974 Ford Pinto

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	4710	3260
IMPACT ANGLE (deg)*	0	60°
IMPACT VELOCITY (mph)**	31.53	31.53
MAX. CRUSH (in)	16.5" --	23.5" --
MAX. INTRUSION (in)	--	--

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Part 572	Part 572
LOCATION	Driver (LF), Passenger (RF)	Driver (LF), Passenger (RF)
RESTRAINT	3-Point Restraint	Unrestrained

NUMBER OF DATA CHANNELS 60
NUMBER OF HIGH SPEED CAMERAS 10

*WITH RESPECT TO TOW TRACK CENTERLINE
**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

TEAM	YEAR	MONTH	CAT	SEQUENCE
1	2	1 1	1 3	0 0 2

TABLE 8-1

TEST NO. 2 - CAR NO. 1

VEHICLE DATA

Vehicle data not collected. Reason? ______

Vehicle No. 1 — 14-15 No. of VIN Characters 1 3

VIN (Left Justify, Omit Production Numbers) 1 0 2 9 H 4 8

7 Make/Model (CPIR Code), Chevrolet Chevelle Malibu Classic 1 1 3 0 1

Mileage (Odometer Reading) 99998 = 99998 mi. or more 6 9 4 3 6.
99999 = Unknown

Model Year 7 4

56 **BODY STYLE**

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT
Curb 0 3, 9 0 0
42 Occupant and Cargo Only __ __, __ 0 0

43 **TOWING ANOTHER VEHICLE**
Yes 1
No 2
Unknown 9

VEHICLE DAMAGE

	Object Contacted	CDC	Veh. No.	Impact No.
(1)	0 1	1 1 F D E W 2	2	1
(2)				
(3)				
(4)				

(1) = Highest Severity (Estimated ΔV)

66 **VEHICLE TOWED FROM SCENE**
Yes 1
No 2
Unknown 9

67 **SOURCE OF VEHICLE DATA**
Inspection at Repair or Tow Facility 1
Inspection at Person's Home 2
Inspection at Scene 3
Not Inspected (Photos or Repair Data) 4
Not Inspected. Reason. ______ 5
Unknown 9

68 **VEHICLE INSPECTION**
Not Inspected 0
Inspected on First Visit 1
Actual Number of Locations Visited (Including Follow-Ups to Same Location) 2 3 4 5 6 7
3 or More 8
Unknown 9

69 **APPLICABLE VEHICLE**
Yes 1
No 2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

Figure 8-2

VEHICLE CRUSH SCHEMATIC

TEST NO. 2 - CAR NO. 1

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

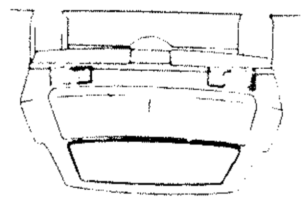
RF 1

LF 2

RR 2

LR 2

1 Yes, 2 No, 3 NA, 4 Unk.



WHEEL STEER ANGLES*

(For locked front wheels or displaced rear axles only)

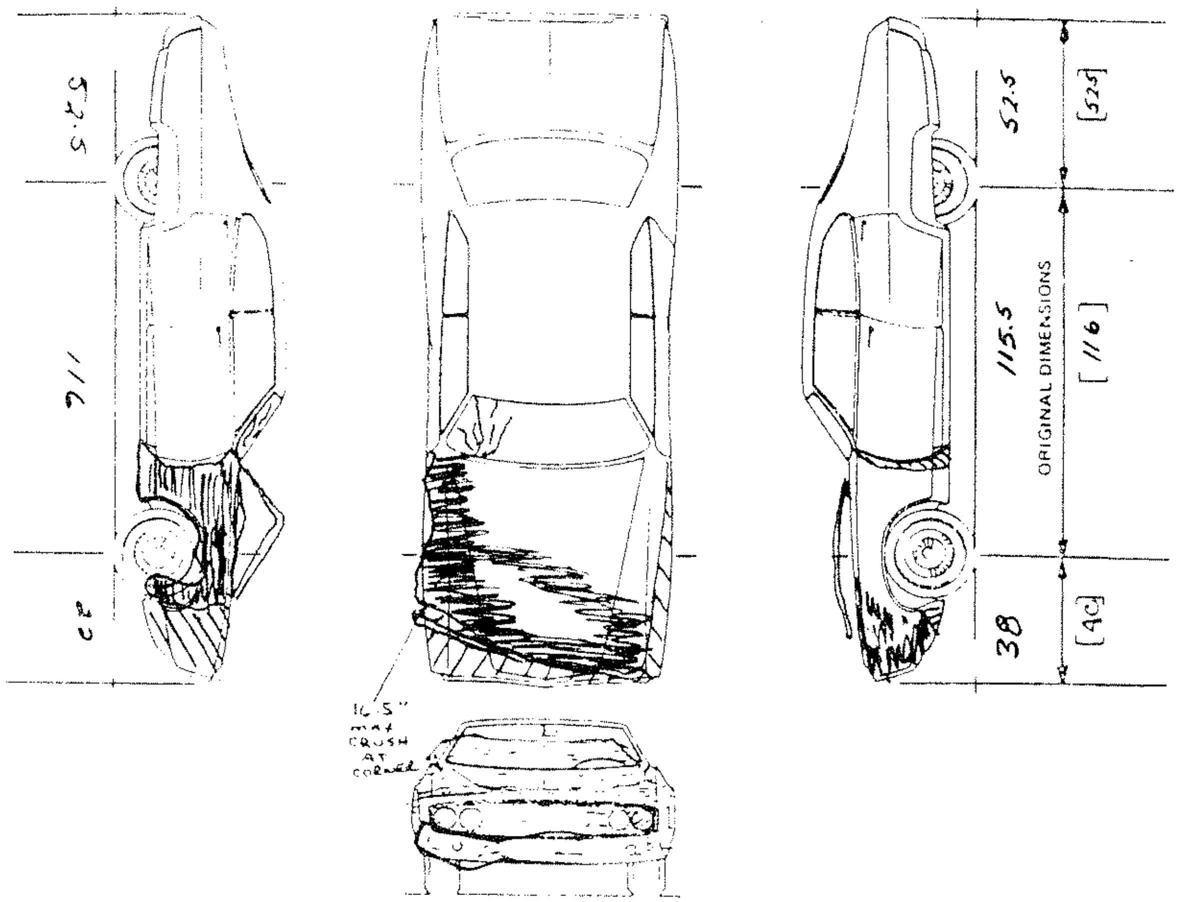
RF ± 0 0

LF ± 2 0

RR ±

LR ±

Within ± 3°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	75.5	.5"	2.4"	3.7"	6.9"	12"	16.5"	±0
2								
3								
4								

NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

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Above bumper
L and D are the same as "Impact 1"

C_1 = 4
C_2 = 7.5
C_3 = 9

C_4 = 13.2
C_5 = 18
C_6 = 24 - max crush

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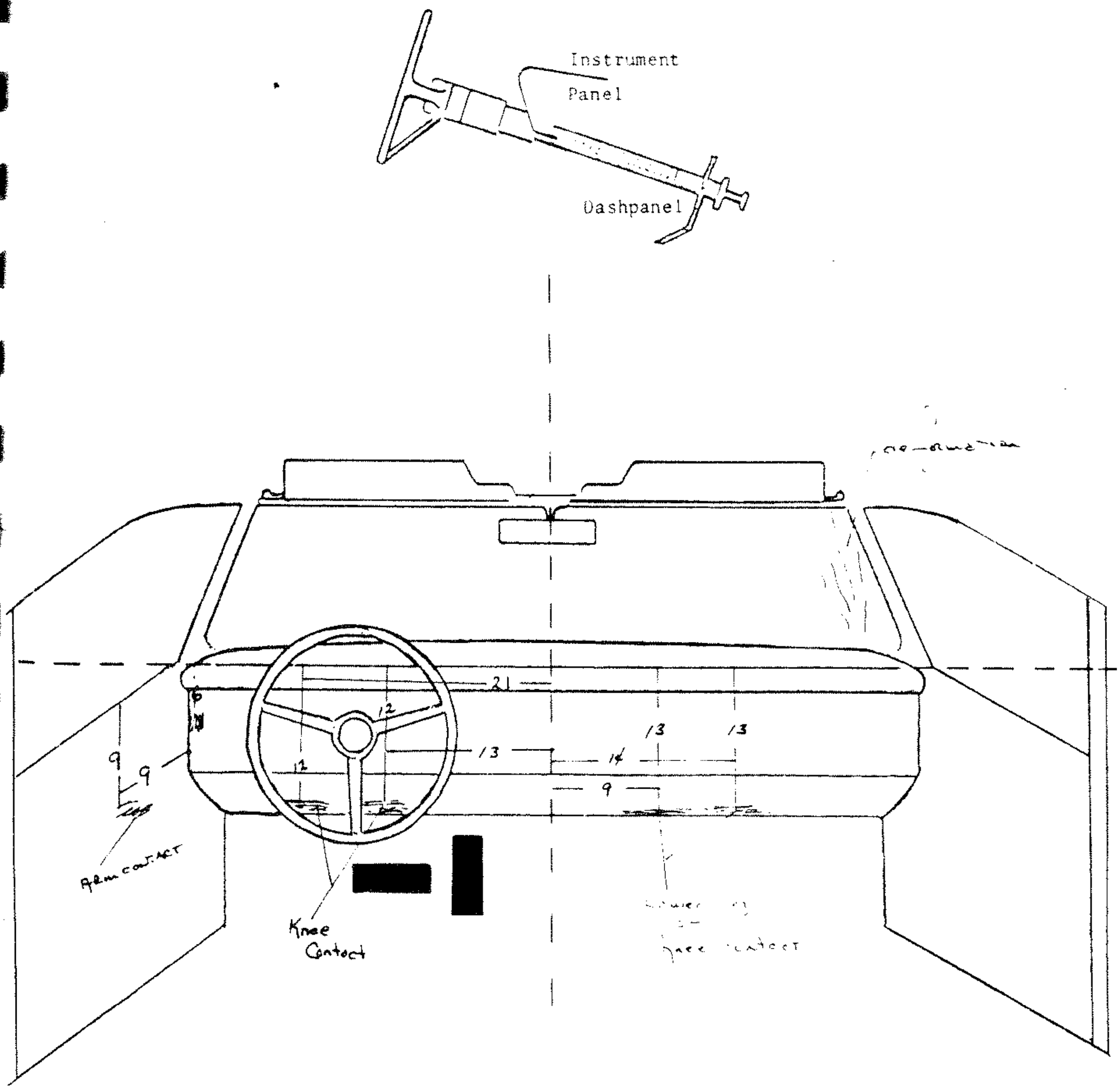
Figure 8-3

OCCUPANT CONTACT DATA
TEST NO. 2 - CAR NO. 1

VEHICLE INTERIOR

Occupant Contacts

CHEVELLE



Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

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TEAM	YEAR	MONTH	DAY	SEQUENCE
1	7	1 1	1 8	0 0 2

TABLE 8-2

TEST NO. 2 - CAR NO. 2

VEHICLE DATA

Vehicle data not collected. Reason? ______

Vehicle No. 2 | 14-15 No. of VIN Characters 1 1

16-22 VIN (Left Justify, Omit Production Numbers) 4 1 1 0 X 2 7

23-27 Make/Model (CPIR Code) Ford Pinto 1 2 1 1 8

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more; 99999 = Unknown 9 9 9 9 9

33-34 Model Year 7 4

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 0 2, 4 0 0

40-42 Occupant and Cargo Only __ __, __ 0 0

43 TOWING ANOTHER VEHICLE
- Yes 1
- No 2
- Unknown 9

VEHICLE DAMAGE

	Object Contacted	CDC	Veh. No.	Impact No.
44-54 (1)	0 3	0 2 R D E W 4	1	1
55-65 (2)				
(3)				
(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE
- Yes 1
- No 2
- Unknown 9

67 SOURCE OF VEHICLE DATA
- Inspection at Repair or Tow Facility 1
- Inspection at Person's Home 2
- Inspection at Scene 3
- Not Inspected (Photos or Repair Data) 4
- Not Inspected. Reason. ______ 5
- Unknown 9

68 VEHICLE INSPECTION
- Not Inspected 0
- Inspected on First Visit 1
- Actual Number of Locations Visited (Including Follow-Ups to Same Location) 2 3 4 5 6 7
- 8 or More 8
- Unknown 9

69 APPLICABLE VEHICLE
- Yes 1
- No 2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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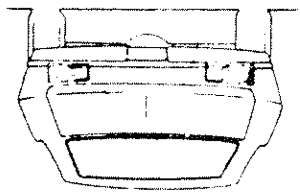
Figure 8-4
VEHICLE CRUSH SCHEMATIC
TEST NO. 2 - CAR NO. 2

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 1
LF 2
RR 2
LR 2

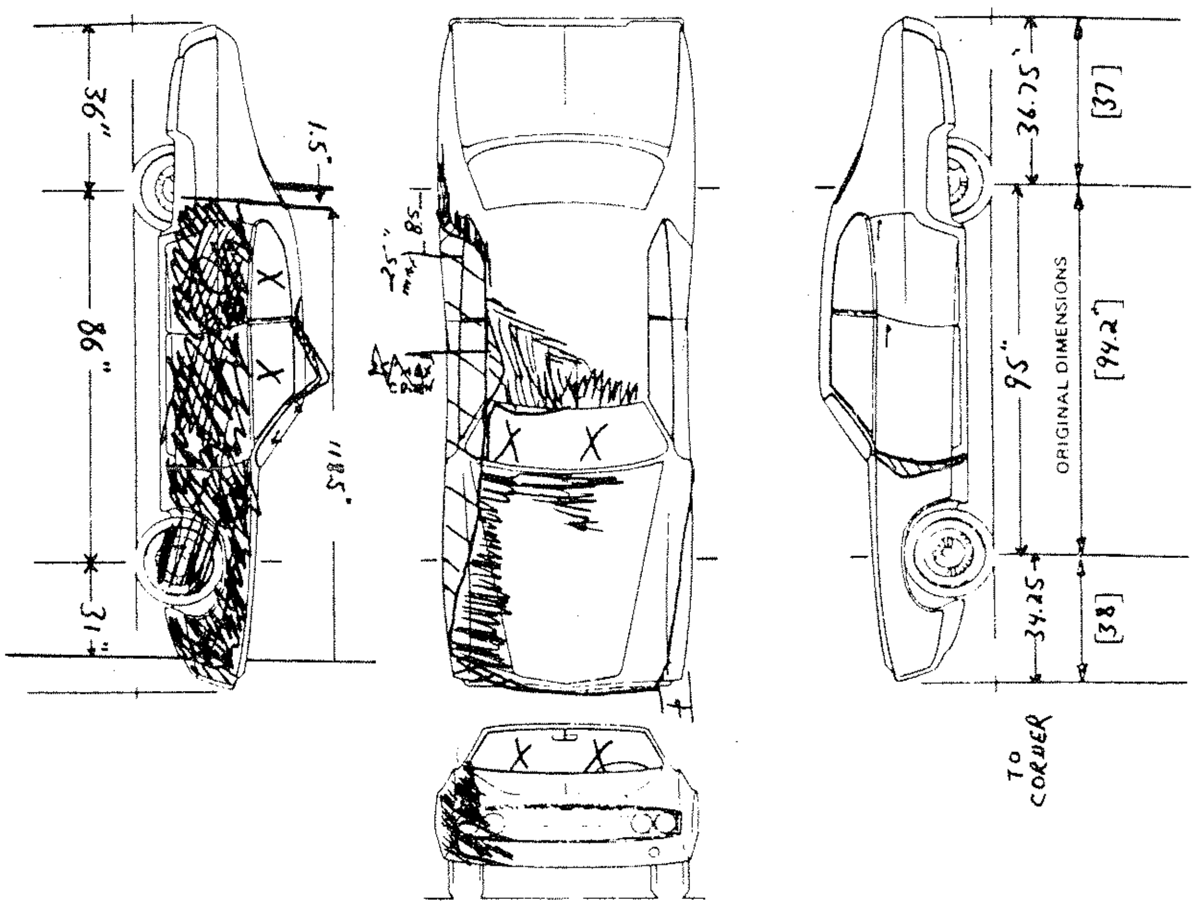
1 Yes, 2 No, 8 NA, 9 Unk.



WHEEL STEER ANGLES*
(For locked front wheels or displaced rear axles only)

RF ± 3 3°
LF ± N/A
RR ± N/A
LR ± N/A

Within ± 5°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	118.5	6.75	22.75"	23.5"	21.3	10"	0	+13.7"
2								
3								
4								

NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS; REAR TO FRONT IN SIDE IMPACTS

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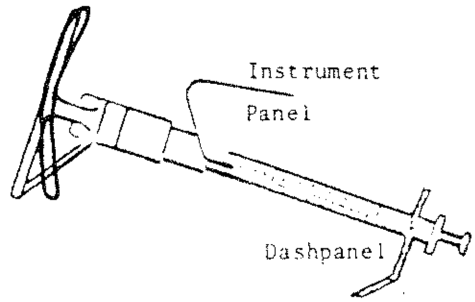
Figure 8-5

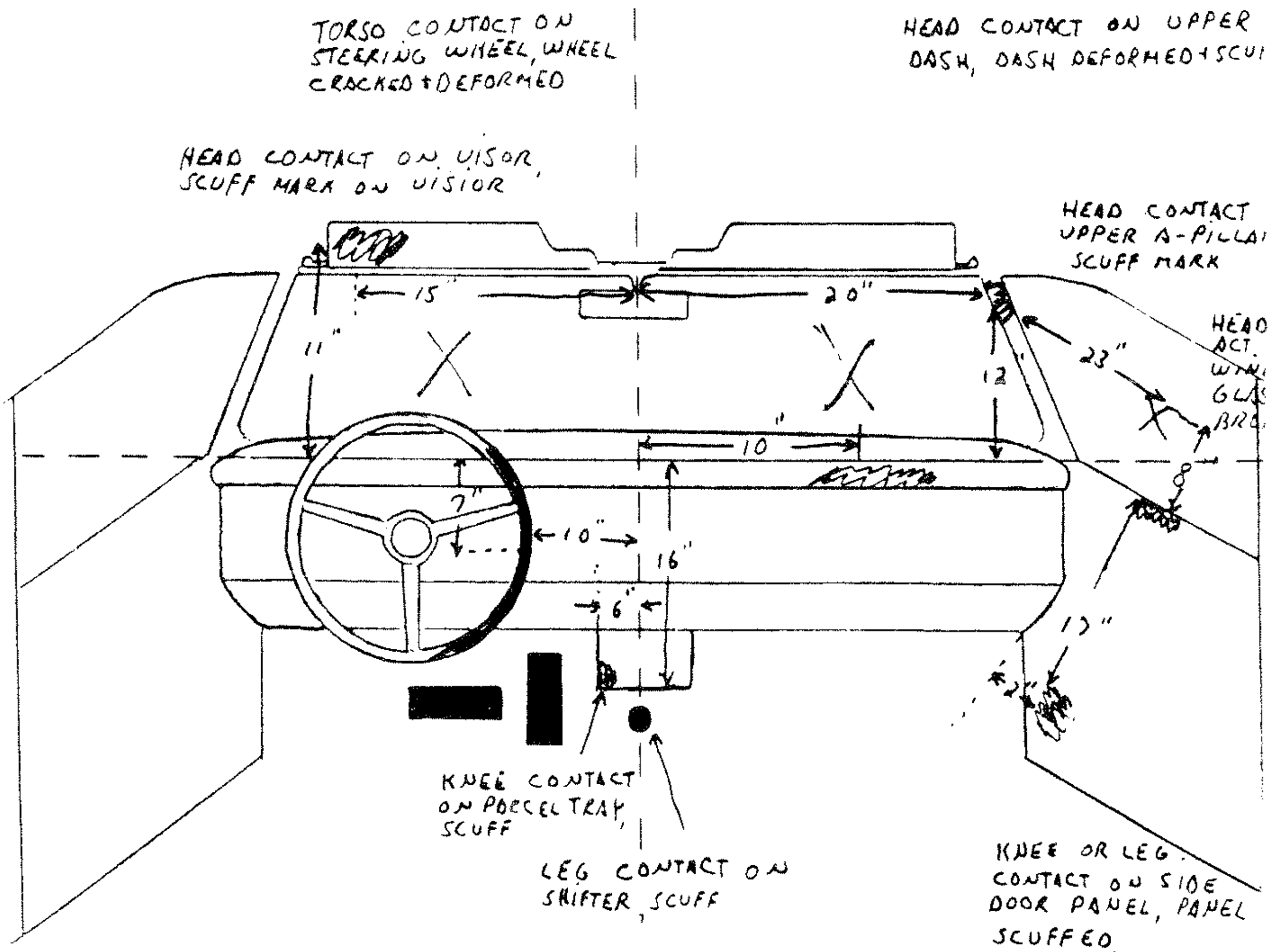
OCCUPANT CONTACT DATA
TEST NO. 2 - CAR NO. 2

VEHICLE INTERIOR

PINTO

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

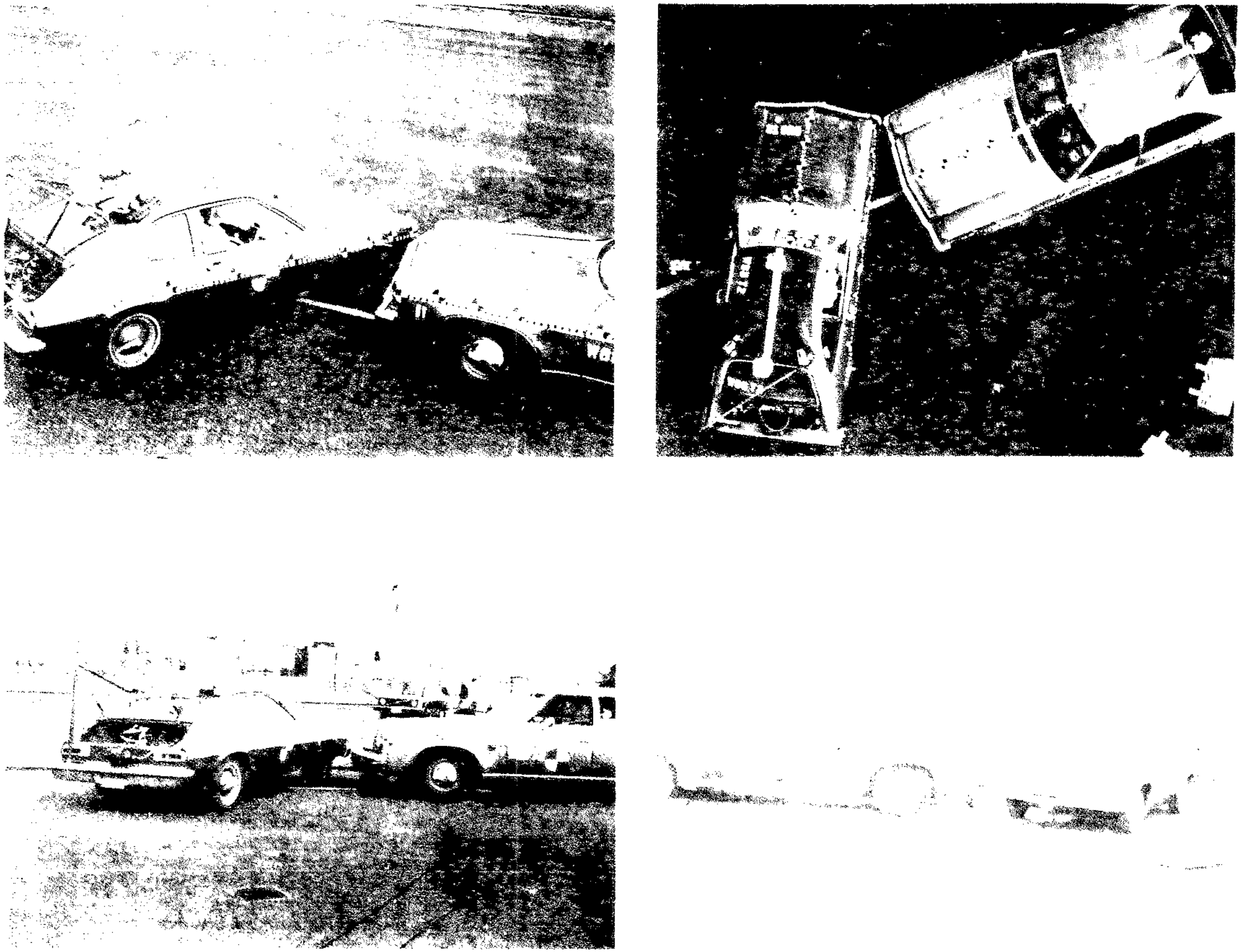


Figure 8-6 TEST NO. 2 – PRE TEST COLLISION CONFIGURATION

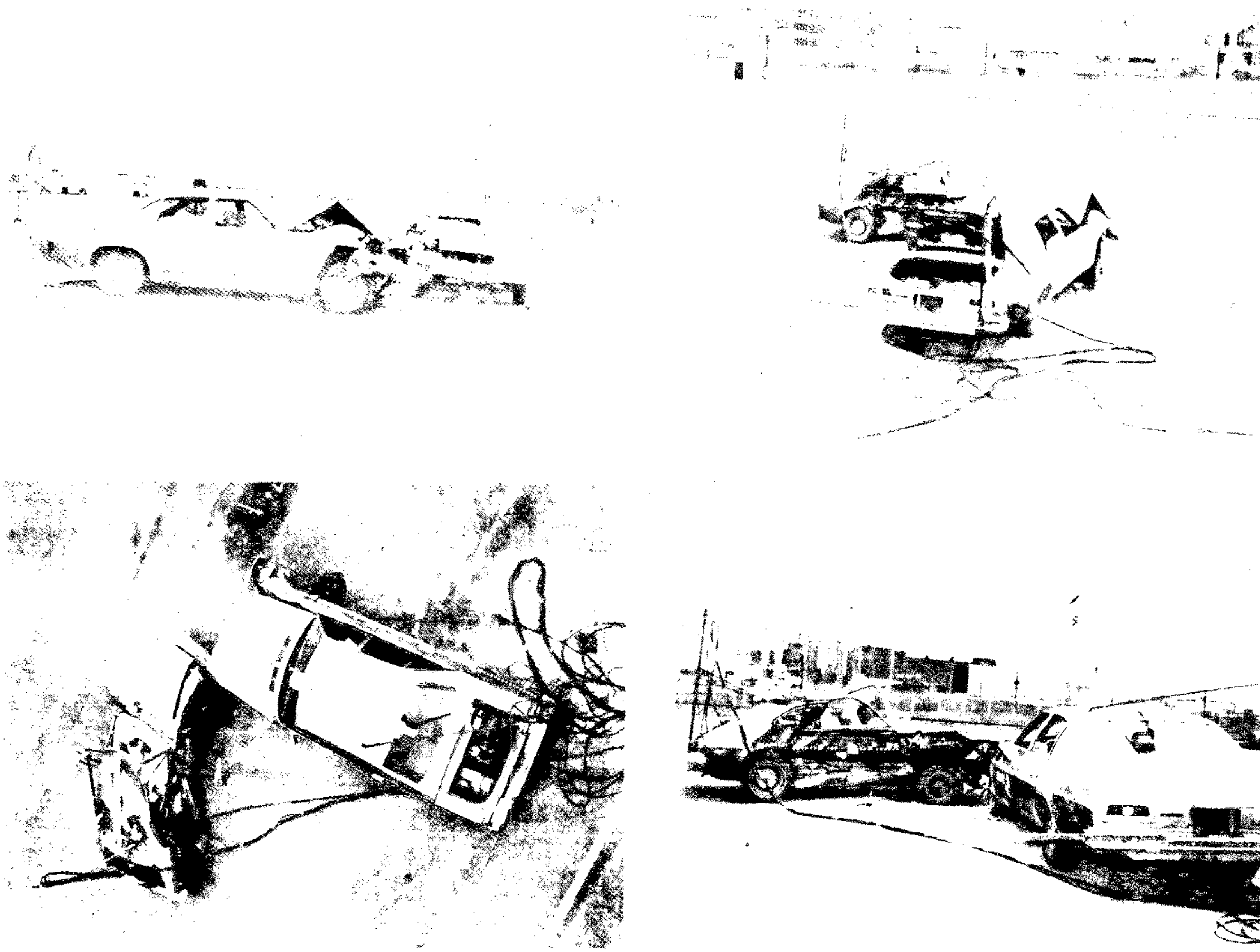


Figure 8-7 TEST NO. 2 — POST TEST COLLISION SCENE

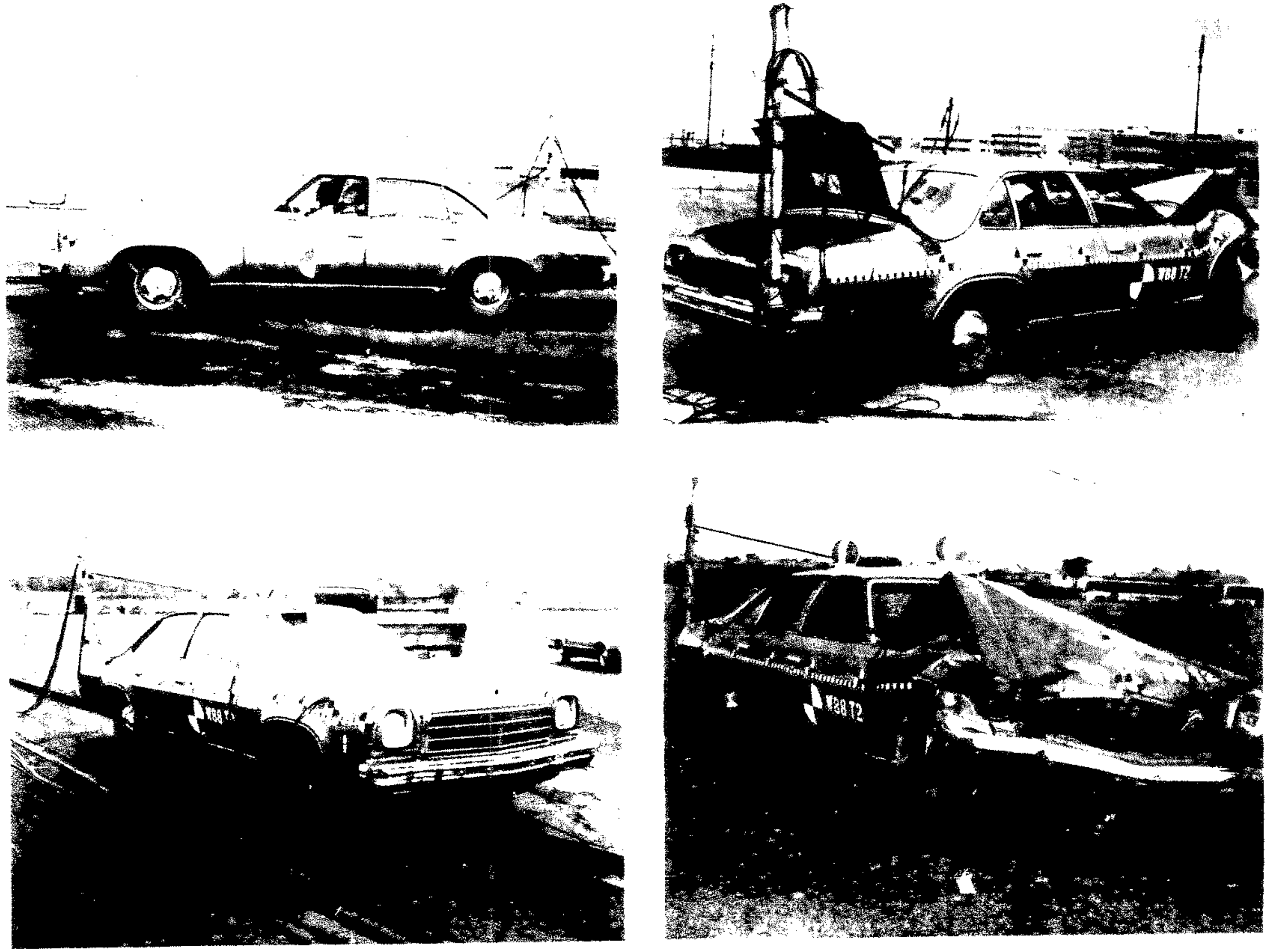


Figure 8-8 TEST NO. 2 – PRE AND POST EXTERIOR VIEWS, CAR NO. 1 - CHEVELLE

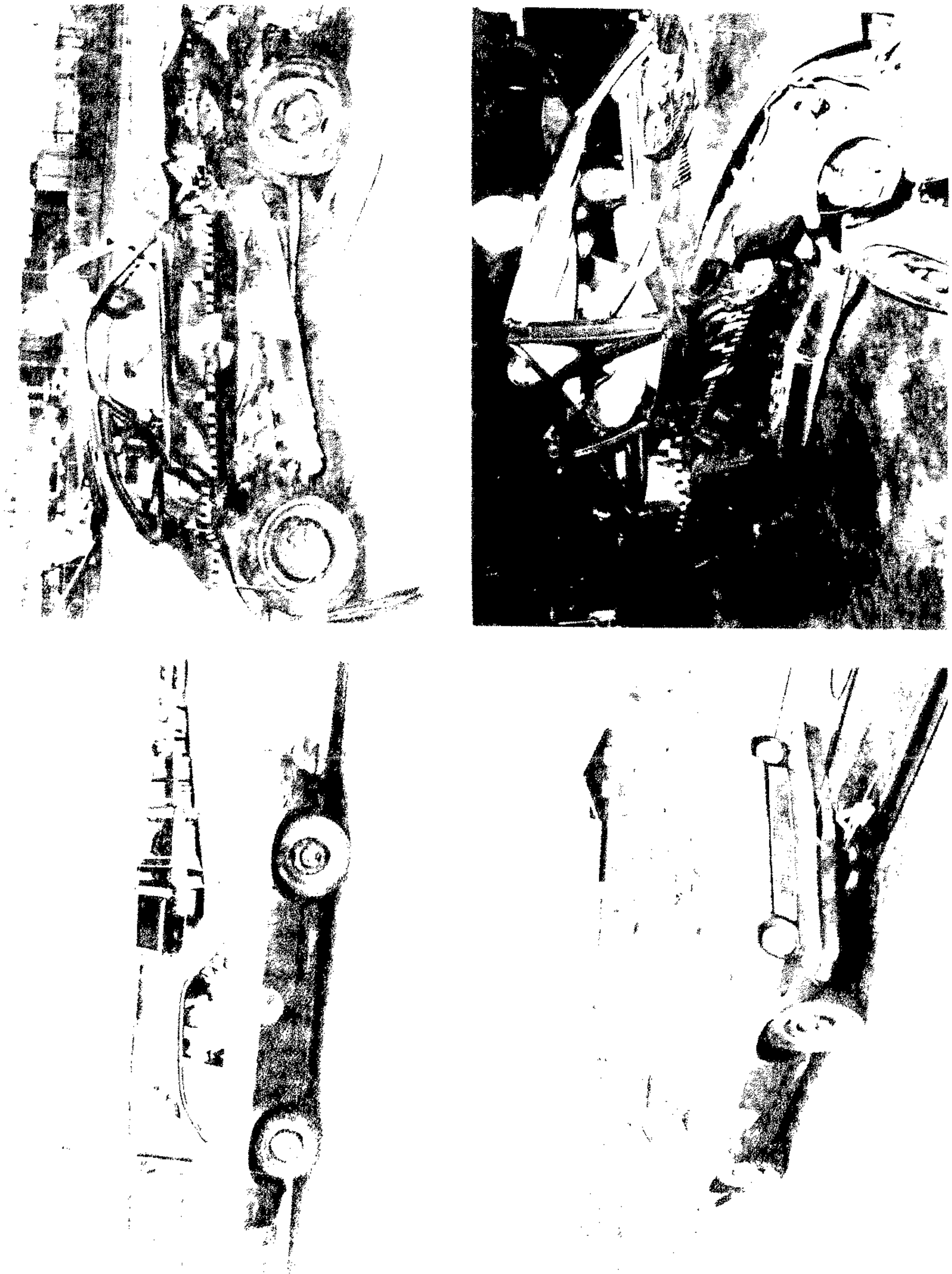


Figure 8-9 TEST NO. 2 — PRE AND POST EXTERIOR VIEWS, CAR NO. 2 - PINTO

Figure 8-10 TEST NO. 2 — PRE AND POST INTERIOR VIEWS, CAR NO. 1 - CHEVELLE

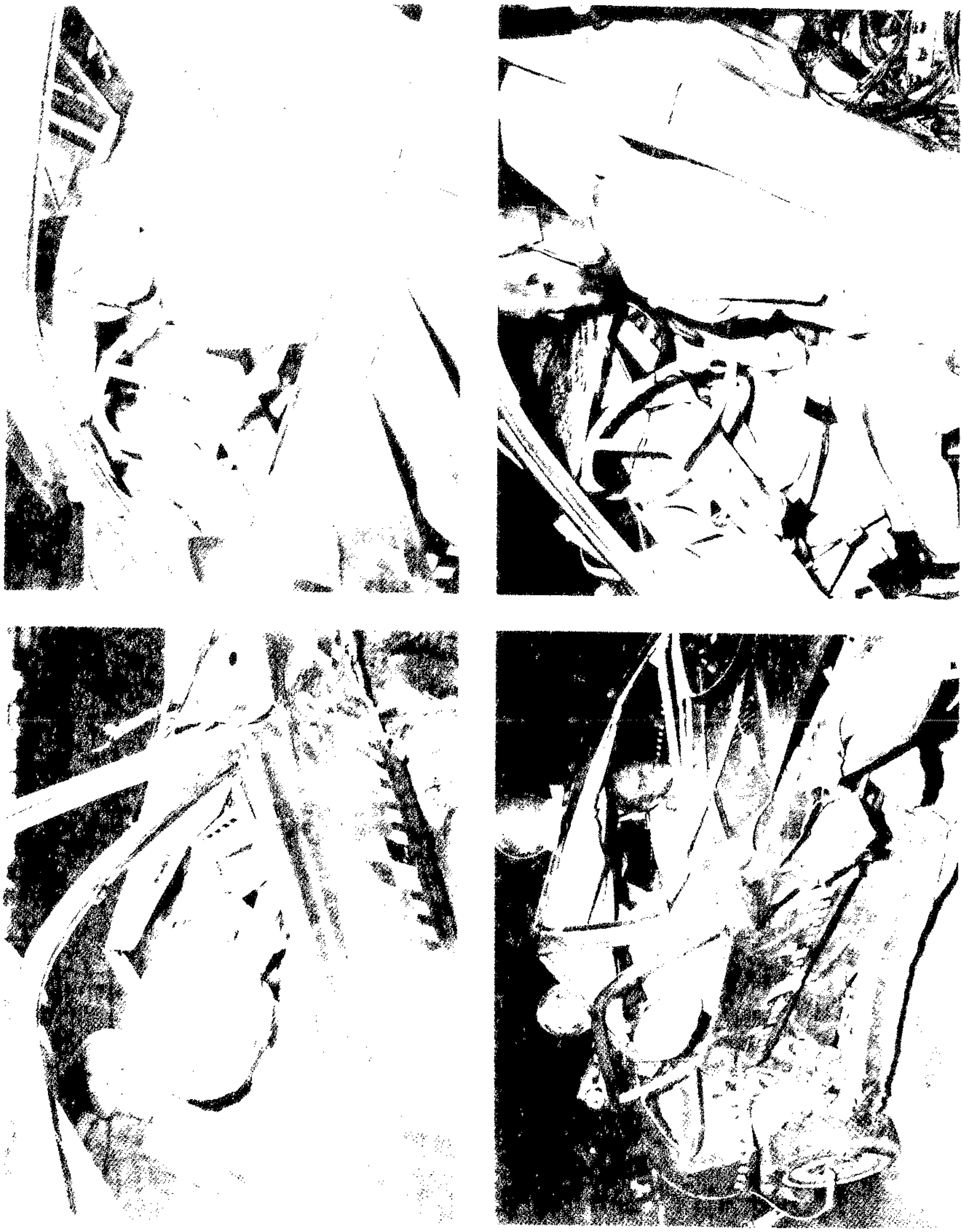


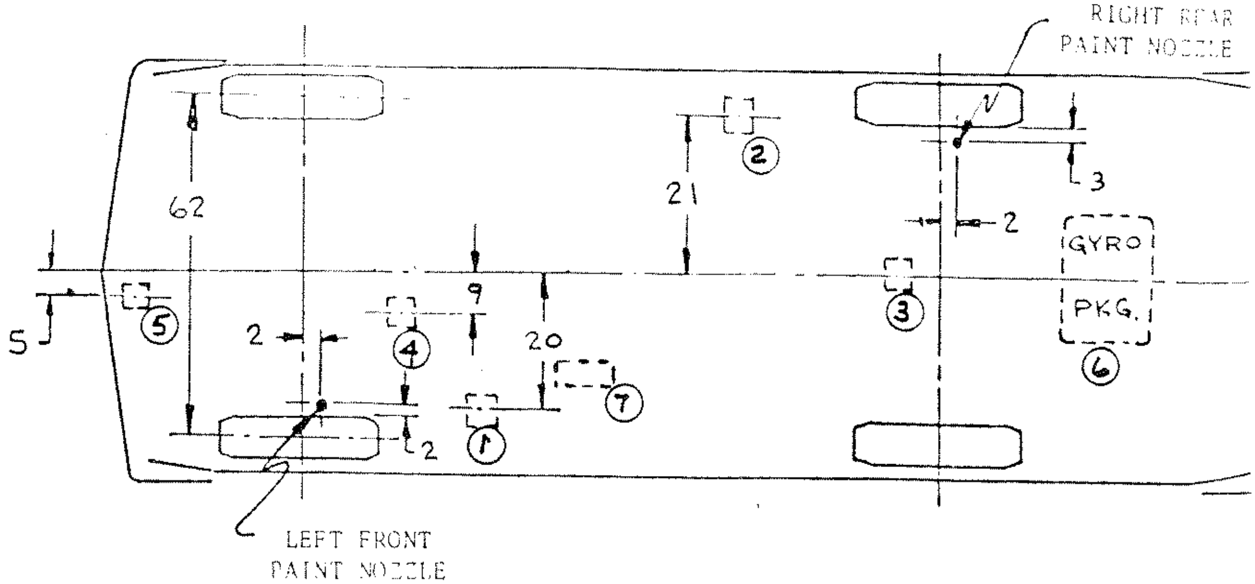
Figure 8-11 TEST NO. 2 — POST INTERIOR VIEW, CAR NO. 2 · PINTO

ELECTRONIC INSTRUMENTATION TEST No. 2

CAR NO. 1 - CHEVELLE

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Left Sill Next to Front Seat	L.F. Corner
2	X,Y,Z	Right Sill Next to Rear Seat	R.R. Corner
3	X,Y,Z	Deck Over Rear Axle	Rear Deck
4	X,Y,Z	Firewall	Firewall
5	X	Front Bumper	Bumper
VEHICLE GYROS			
Pitch Angle - 6	Q	On Centerline of Trunk Comp.	Pitch Angle
Roll Angle - 6	P	On Centerline of Trunk Comp.	Roll Angle
Yaw Angle - 6	R	On Centerline of Trunk Comp.	Yaw Angle
Yaw Rate - 6	$\dot{R}$	On Centerline of Trunk Comp.	Yaw Rate
MISCELLANEOUS			
L.F. Wheel Velocity	$\dot{X}$	L.F. Wheel	L.F. Wheel Velocity
R.R. Wheel Velocity	$\dot{X}$	R.R. Wheel	R.R. Wheel Velocity
L.R. Wheel Velocity	$\dot{X}$	L.R. Wheel	L.R. Wheel Velocity
Steer Angle	θ	Front Wheel Steering Linkage	Steer Angle
7	CRASH RECORDER	UNDER FRONT SEAT	

* See Accelerometer Layout Diagram Figure 8-12



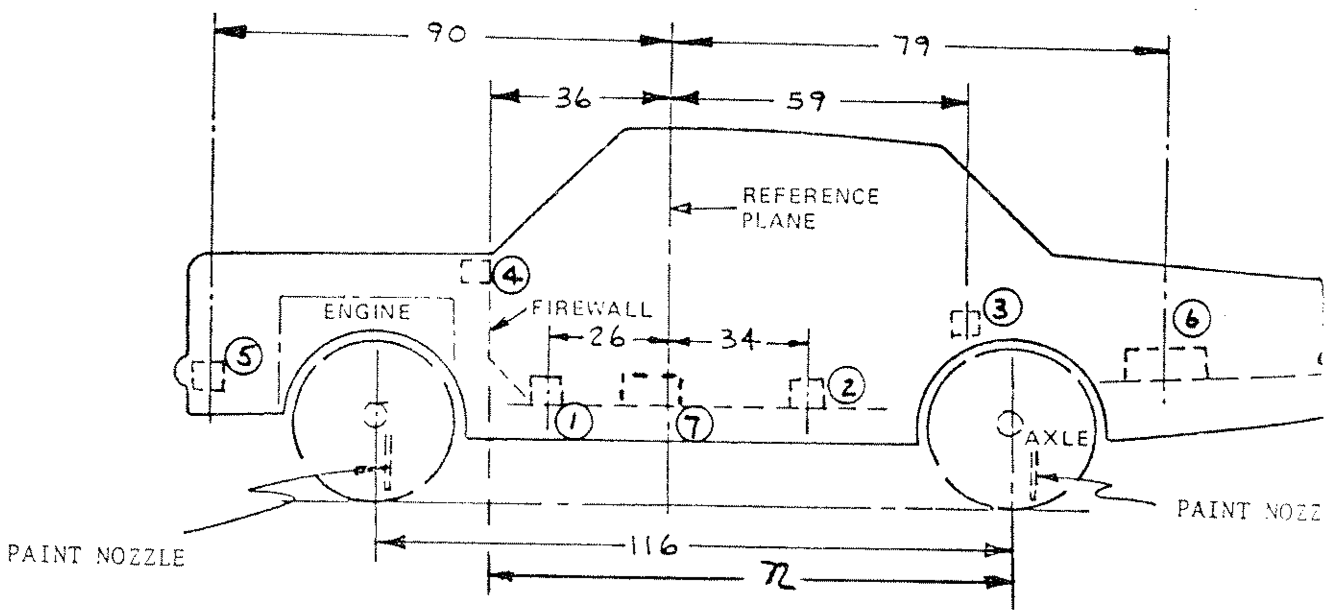


Figure 8-12 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 1 - 1974 CHEVELLE - TEST NO. 2

ELECTRONIC INSTRUMENTATION TEST No. 2

CAR NO. 2 - PINTO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Left Sill Next to Front Seat	L.F. Corner
2	X,Y,Z	Left Sill Next to Rear Sear	L.R. Corner
3	Y	Left Front Door	L.F. Door
4	Y	Right Front Door (Upper)	Upper Right Front Door
5	Y	Right Front Door (lower)	Lower Right Front Door
6	X,Y,Z	Firewall	Firewall
7	X,Y,Z	Rear Deck Over Rear Axle	Rear Deck
VEHICLE GYRO			
Pitch Angle - 8	Q	On Centerline of Trunk Comp.	Pitch Angle
Roll Angle - 8	P	On Centerline of Trunk Comp.	Roll Angle
Yaw Angle - 8	R	On Centerline of Trunk Comp.	Yaw Angle
Yaw Rate - 8	Ṙ	On Centerline of Trunk Comp.	Yaw Rate
MISCELLANEOUS			
L.F. Wheel Velocity	Ẋ	L. F. Wheel	L.F. Wheel Velocity
R.R. Wheel Velocity	Ẋ	R. R. Wheel	R.R. Wheel Velocity
L.R. Wheel Velocity	Ẋ	L. R. Wheel	L.R. Wheel Velocity
Steer Angle	θ	Front Wheel Steering Linkage	Steer Angle
DUMMY			
L.F. Head	X,Y,Z	L.F. Seat	Dummy (LF) Head
L.F. Chest	X,Y,Z	L.F. Seat	Dummy (LF) Chest
L.F. Pelvic	Y	L.F. Seat	Dummy (LF) Pelvic
L.F. Femurs	R,L**	L.F. Seat	Dummy (LF) Femurs
R.F. Head	X,Y,Z	R.F. Seat	Dummy (RF) Head
R.F. Chest	X,Y,Z	R.F. Seat	Dummy (RF) Chest
R.F. Pelvic	Y	R.F. Seat	Dummy (R.F.) Pelvic
R.F. Femurs	R,L**	R.F. Seat	Dummy (RF) Femurs
	CRASH RECORDER UNDER FRONT SEAT		

*SEE ACCELEROMETER LAYOUT DIAGRAM FIGURE 8-13

**RIGHT & LEFT FEMUR FORCES

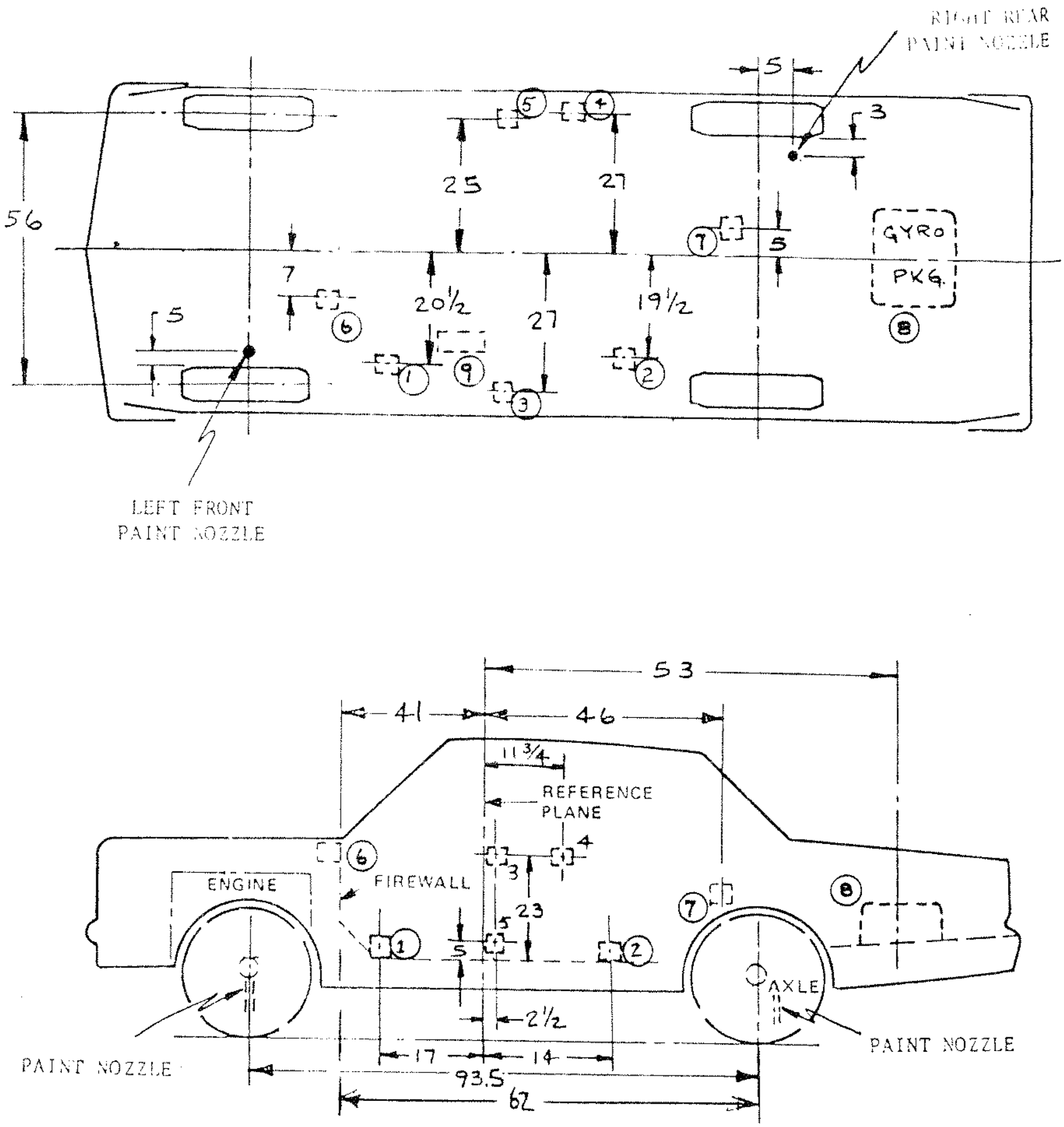


Figure 8-13 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 2 - 1974 FORD PINTO - TEST NO. 2

TABLE 8-5

VEHICLE TEST WEIGHTS - TEST NO. 2

BULLET VEHICLE

CAR 1 - 1974 CHEVROLET CHEVELLE

Left Front	1250 lbs.	Left Rear	1060 lbs.
Right Front	1330 lbs.	Right Rear	1070 lbs.
Total Front	2580 lbs.	Total Rear	2130 lbs.

Total Weight = 2580 lbs. + 2130 lbs. = 4710 lbs.

Wheel Base 116 in.

$$Cg_{FW} = \frac{2130 \text{ lbs.}}{4710 \text{ lbs.}} \quad 116 \text{ in.} = 52.45 \text{ in.}$$

TARGET VEHICLE

CAR 2 - 1974 FORD PINTO

Left Front	850 lbs.	Left Rear	860 lbs.
Right Front	780 lbs.	Right Rear	770 lbs.
Total Front	1630 lbs.	Total Rear	1630 lbs.

Total Weight = 1630 lbs. + 1630 lbs. = 3260 lbs.

Wheel Base 93.5 in.

$$Cg_{FW} = \frac{1630 \text{ lbs.}}{3260 \text{ lbs.}} \quad 93.5 \text{ in.} = 46.75 \text{ in.}$$

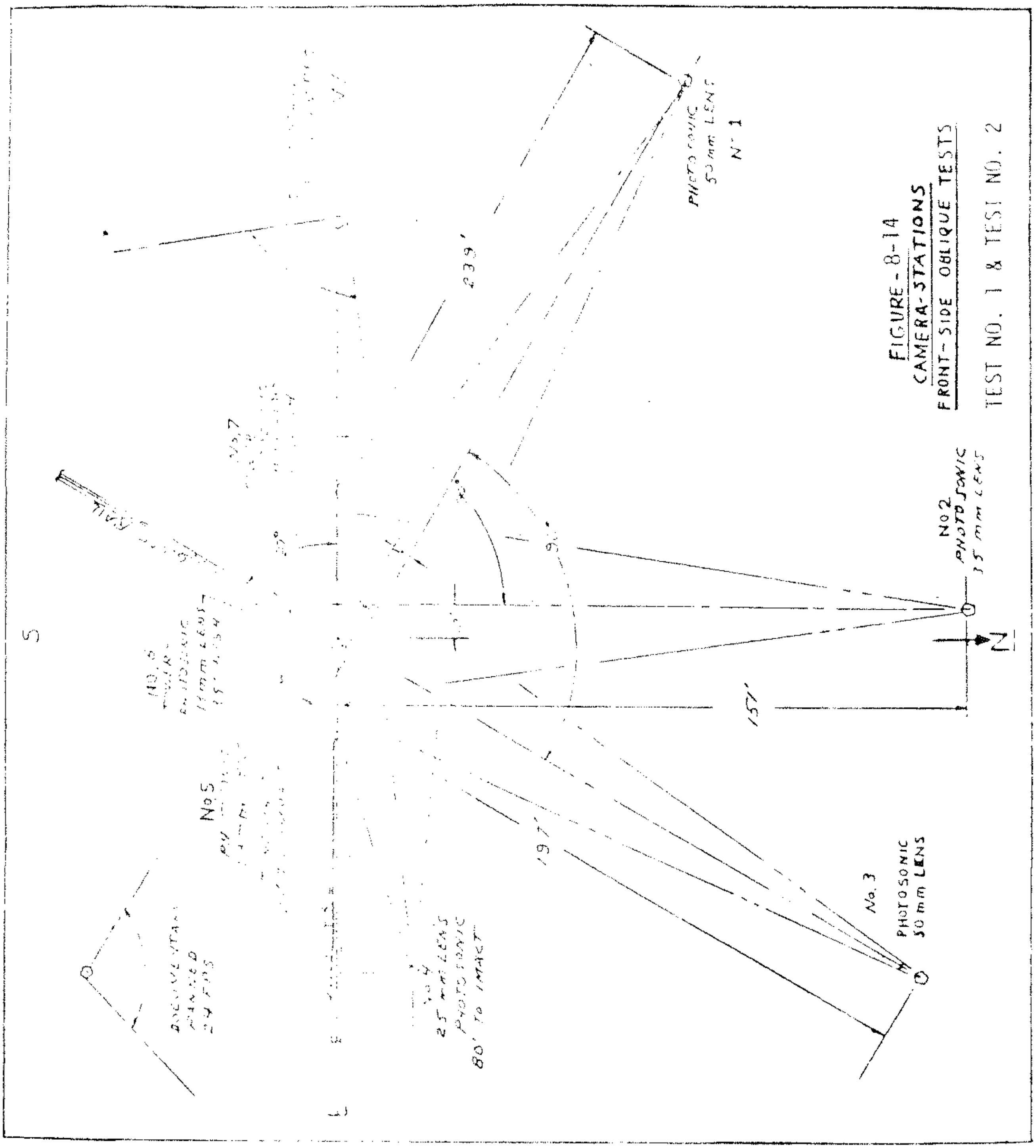


FIGURE-8-14
CAMERA-STATIONS
FRONT-SIDE OBLIQUE TESTS
TEST NO. 1 & TEST NO. 2

TABLE 8-6

DATA CAMERA LOG

PROJECT - RICSAC

TEST NO. 2
DATE: November 18, 1977

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
2	NORTHWEST	PHOTOSONIC	35 MM	400
3	NORTH	PHOTOSONIC	50 MM	550
4	NORTHEAST	PHOTOSONIC	25 MM	900
5	TOWER 45	PHOTOSONIC	13 MM	400
6	TOWER CLOSE	PHOTOSONIC	13 MM	350
7	TOWER WIDE	PHOTOSONIC	8 MM	425
8	O. B. ROOF DRIVER	STALEX	8 MM	1400
9	O. B. ROOF PASS.	STALEX	8 MM	1500
10	O. B. DOOR	STALEX	8 MM	1300

NOTE: 1. CAMERAS ARE LISTED ACCORDING TO SPLICING SEQUENCE OF FILM

2. REAL TIME MOVIE FILM COVERAGE OF PRE- AND POST-CRASH AND CRASH EVENT ARE SPLICED AT START AND END OF FILM (24 fps).

3. FOR CAMERA LOCATIONS AND DISTANCE TO SUBJECT SEE FIGURE

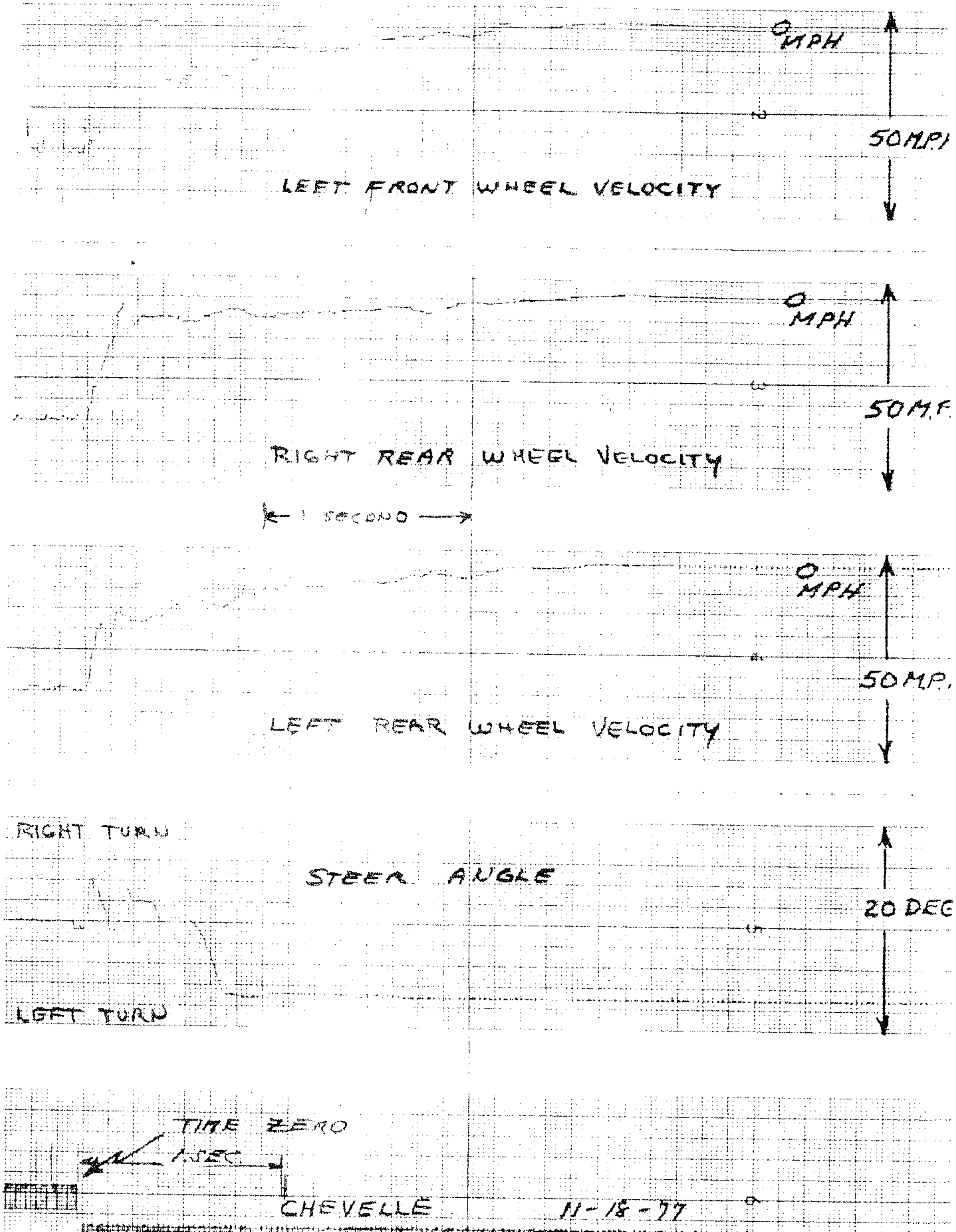


Figure 8-15 TEST NO. 2
CAR NO. 1 WHEEL RESPONSES

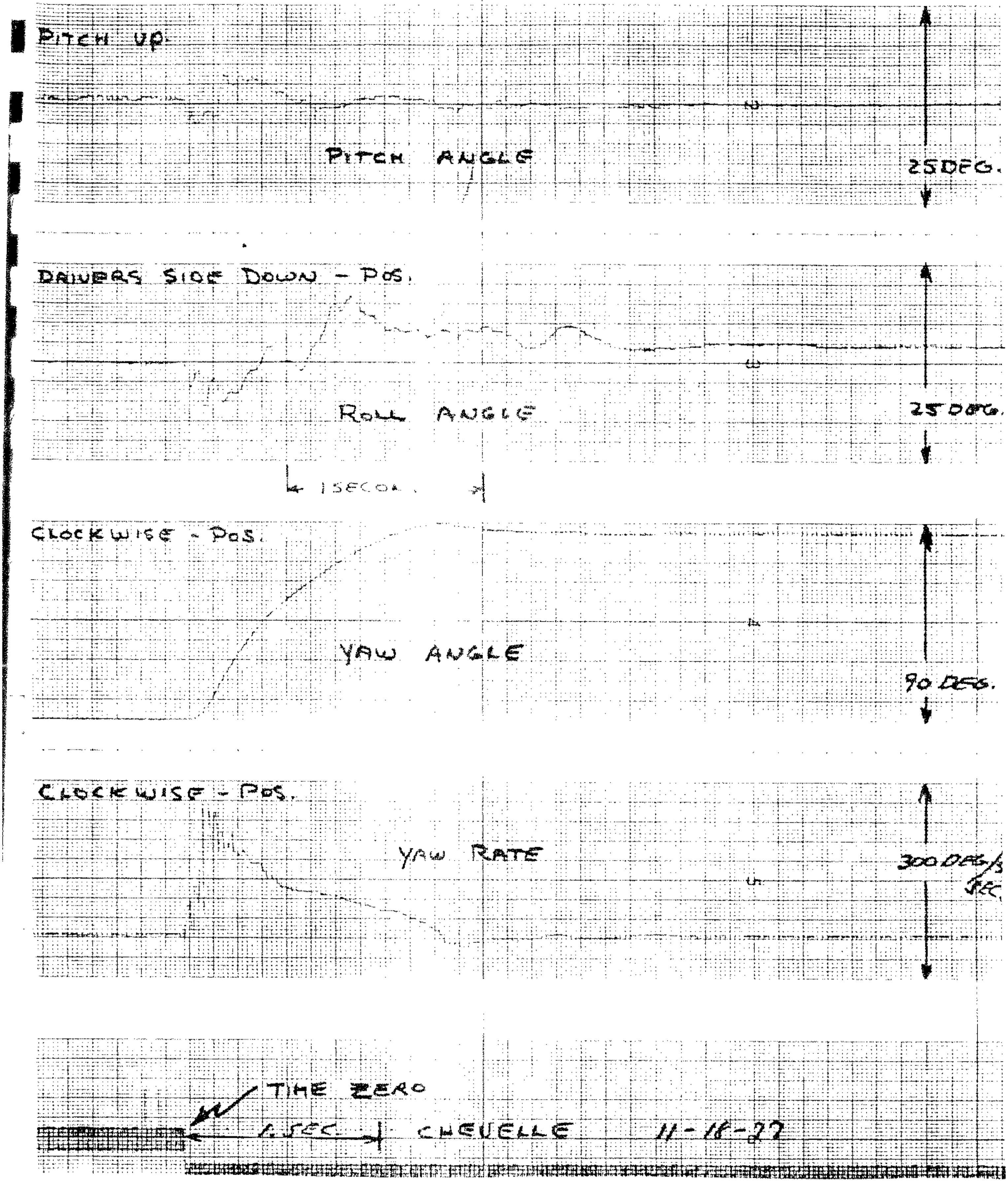


Figure 8-16 TEST NO. 2
CAR NO. 1 VEHICLE ATTITUDE

ZQ-6057-V-4

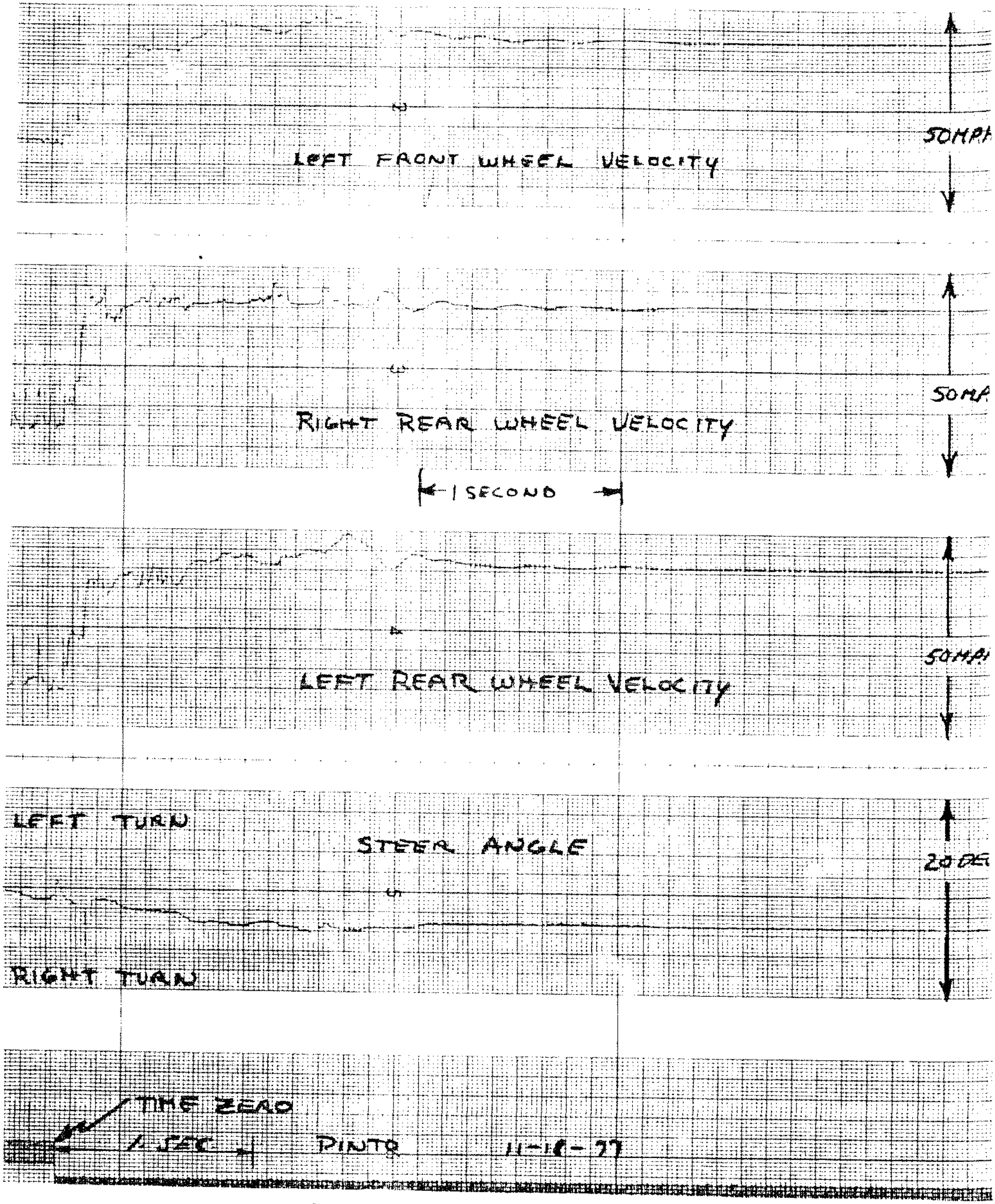


Figure 8-17 TEST NO. 2
CAR NO. 2 WHEEL RESPONSES

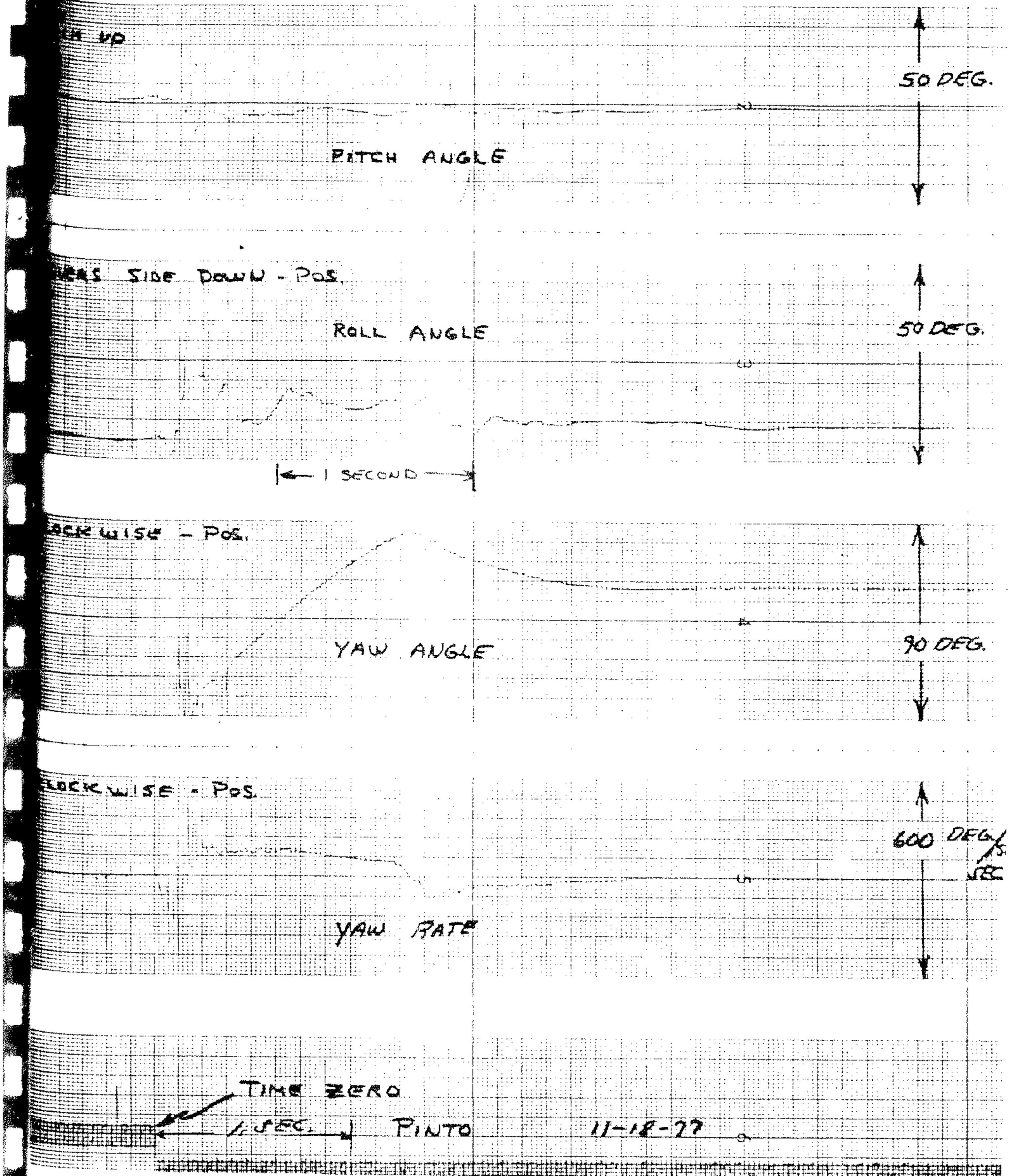


Figure 8-18 TEST NO. 2 - CAR NO. 2
VEHICLE ATTITUDE

RICSAC TEST NO. 2

VEHICLE RESPONSES

CAR NO. 1 CHEVELLE

DATA PLOTS

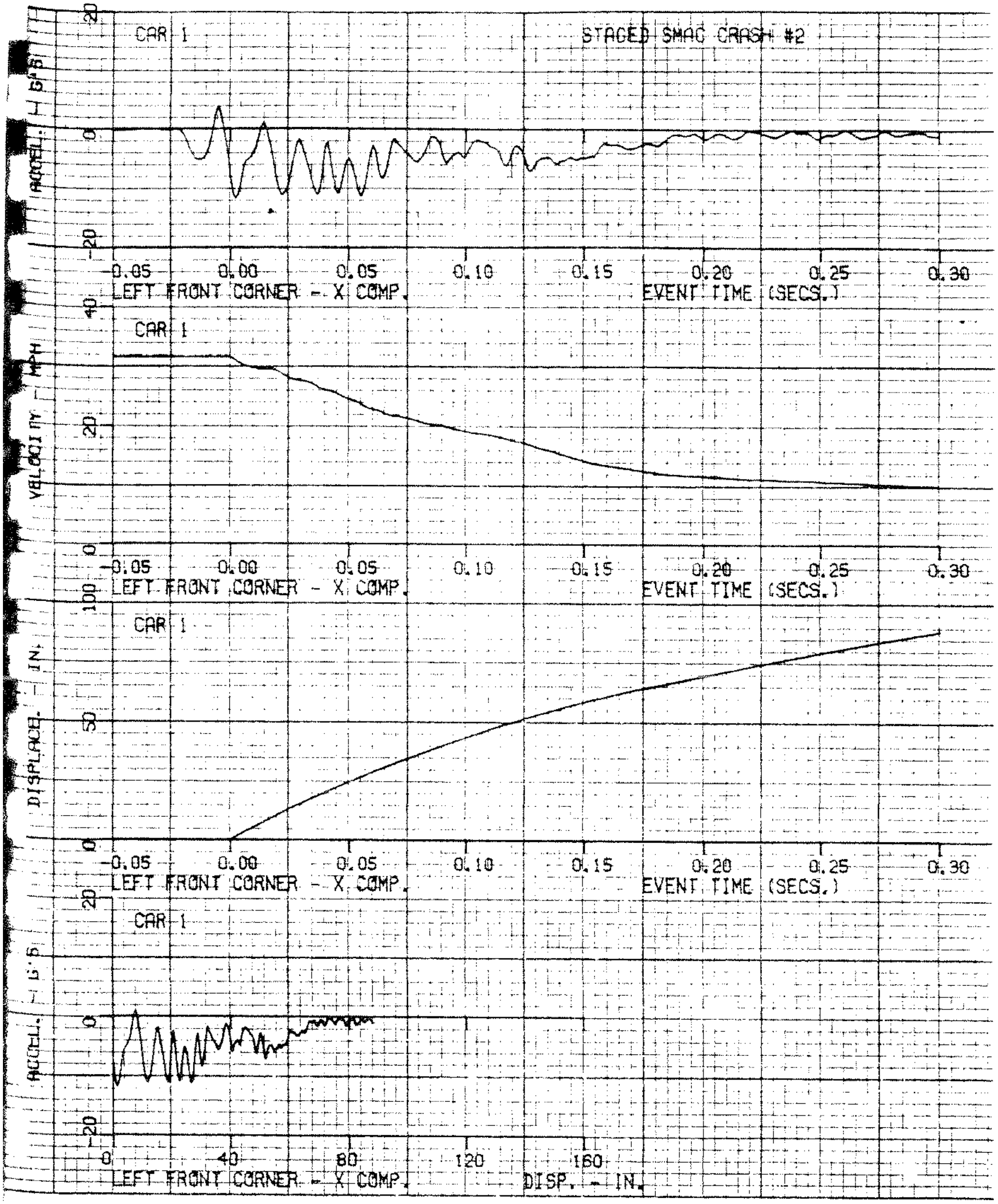
ACCELERATION TIME HISTORIES

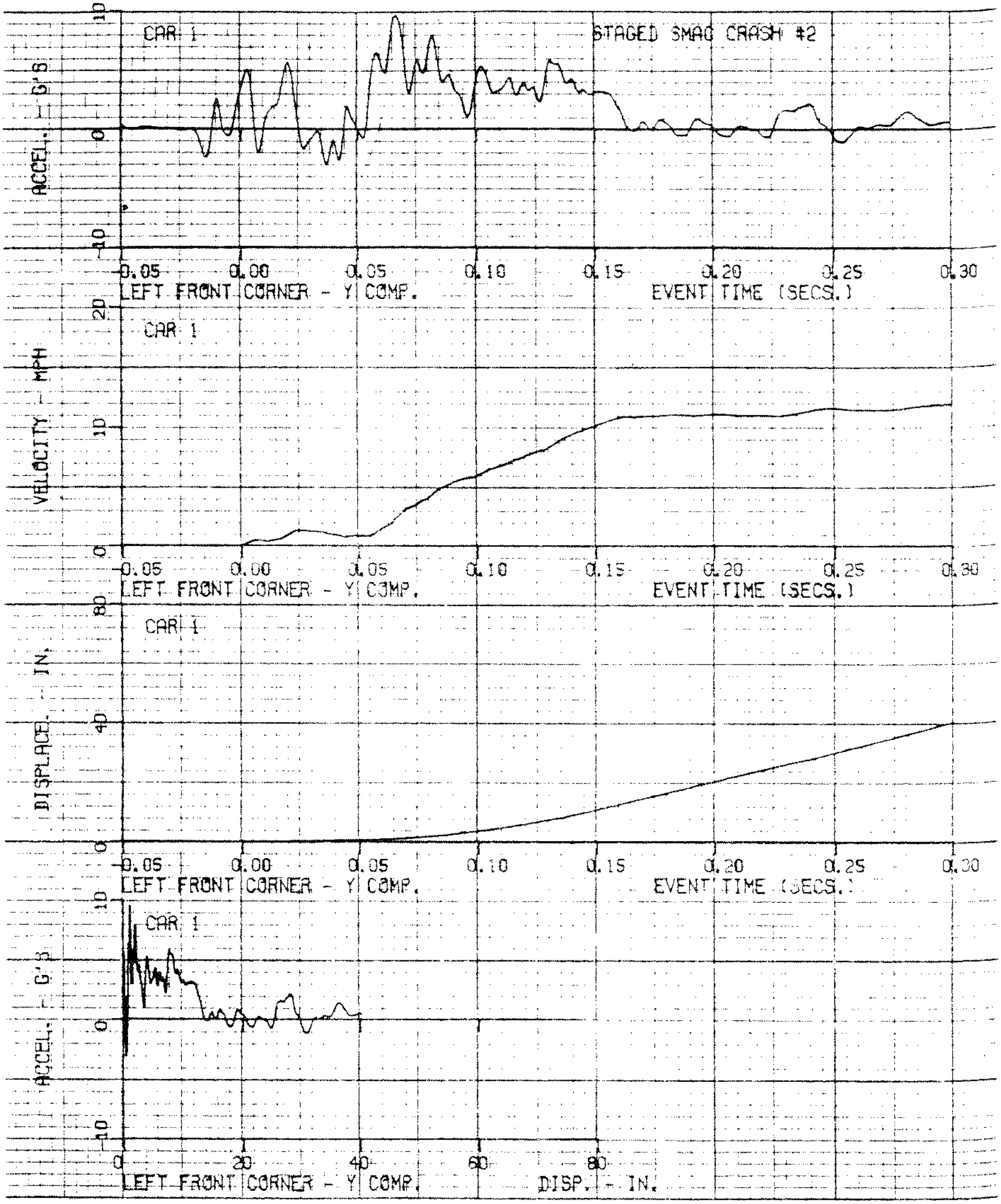
VELOCITY TIME HISTORIES

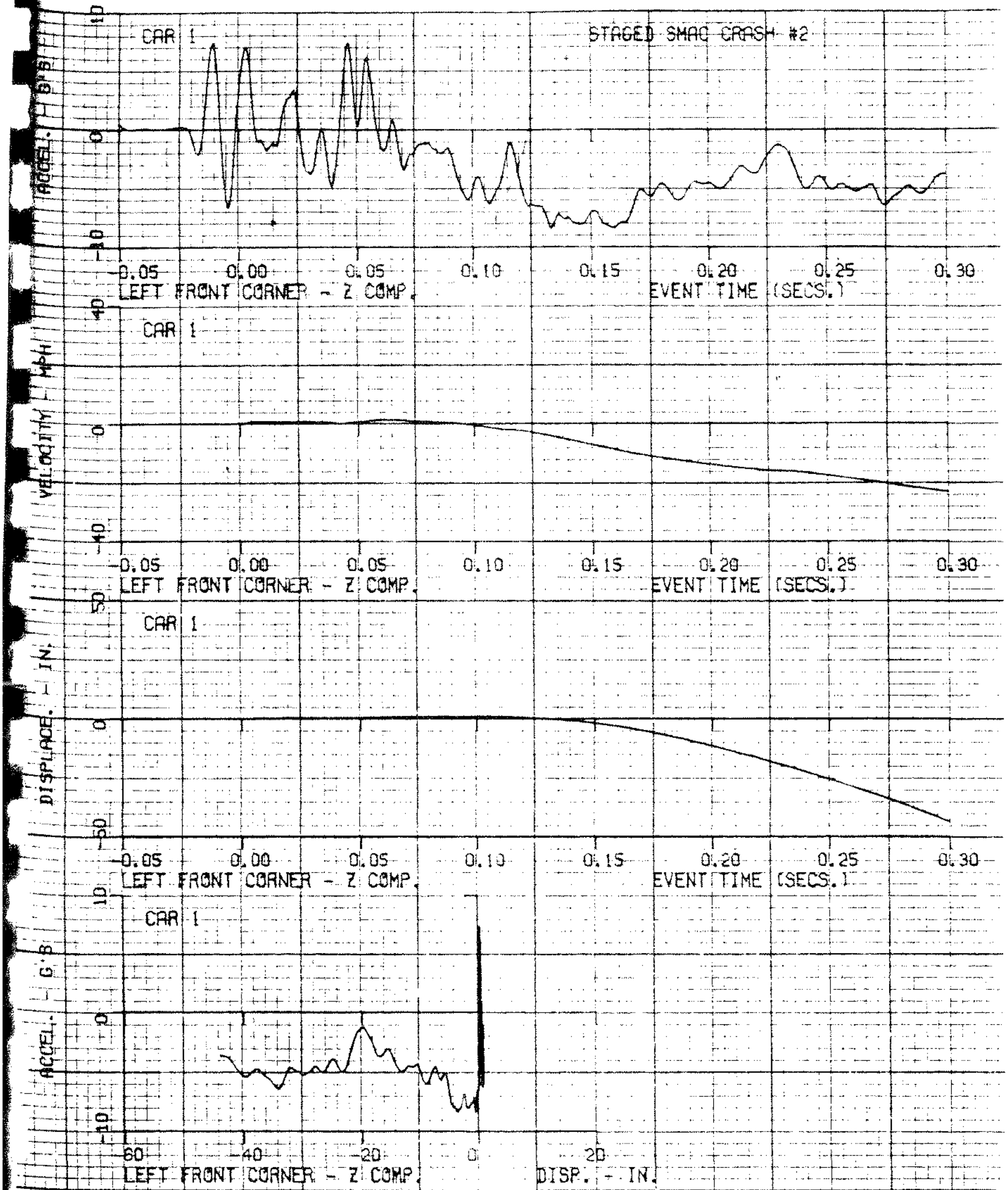
DISPLACEMENT TIME HISTORIES

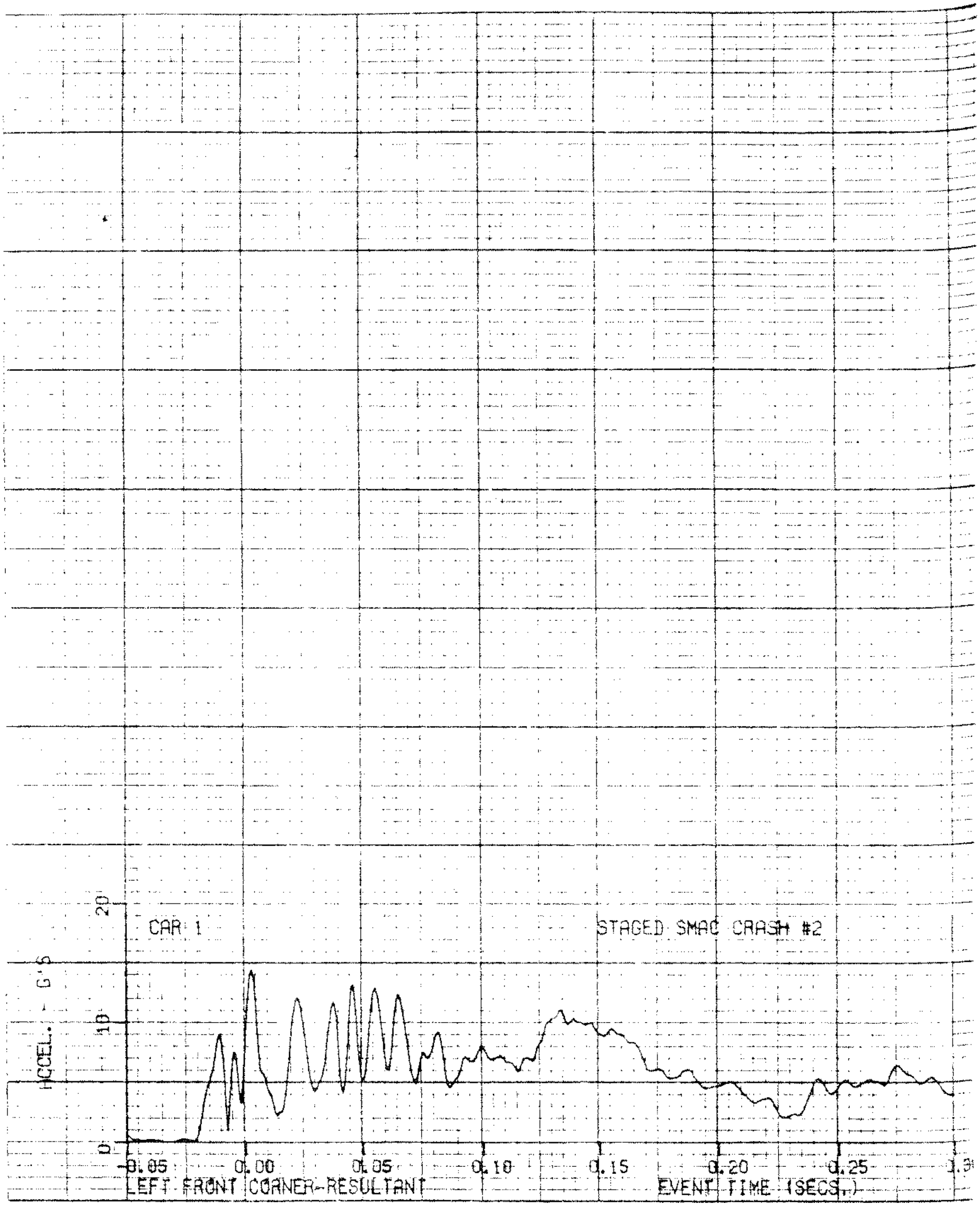
ACCELERATION VS DISPLACEMENT

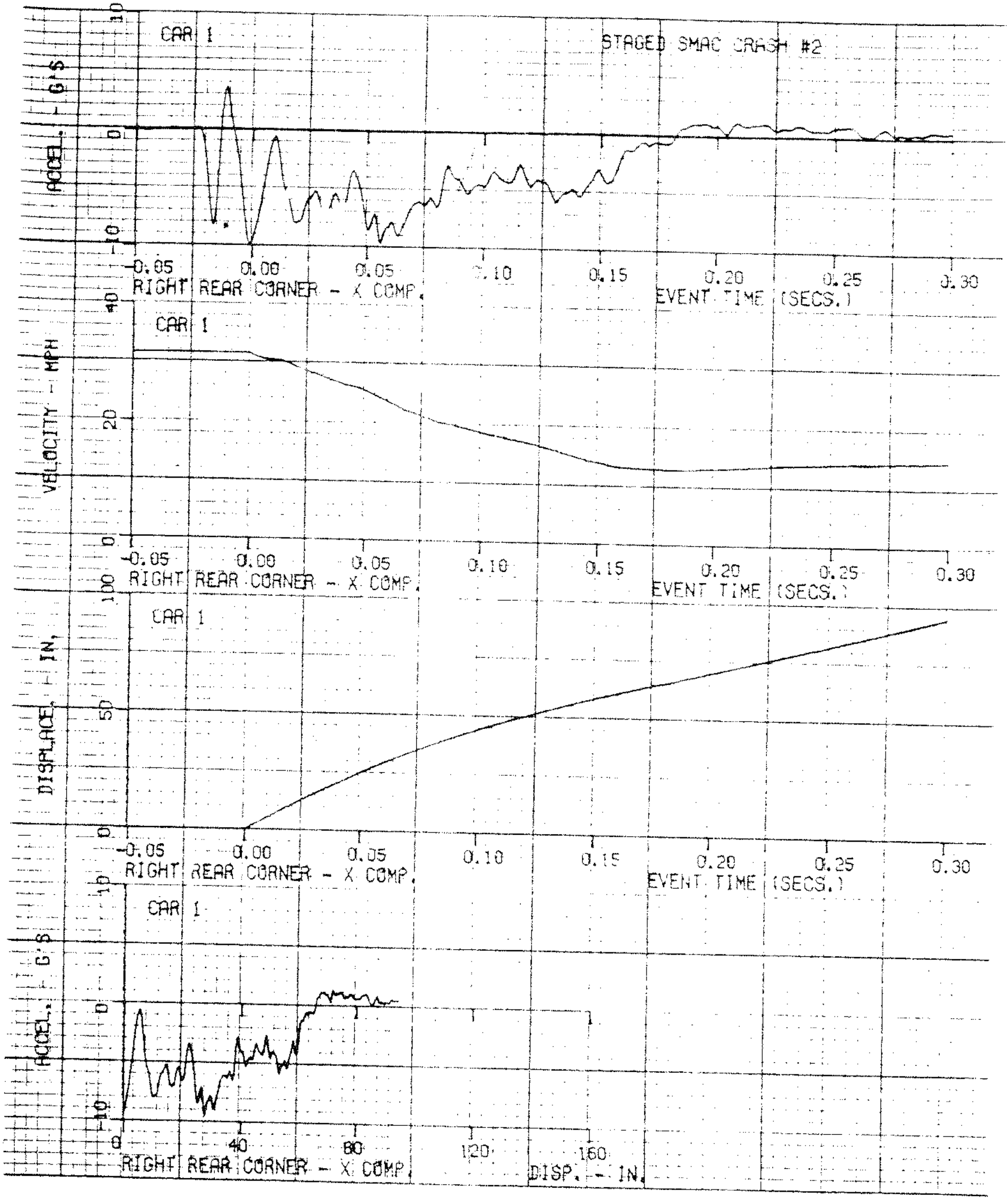
FILTER CLASS 60

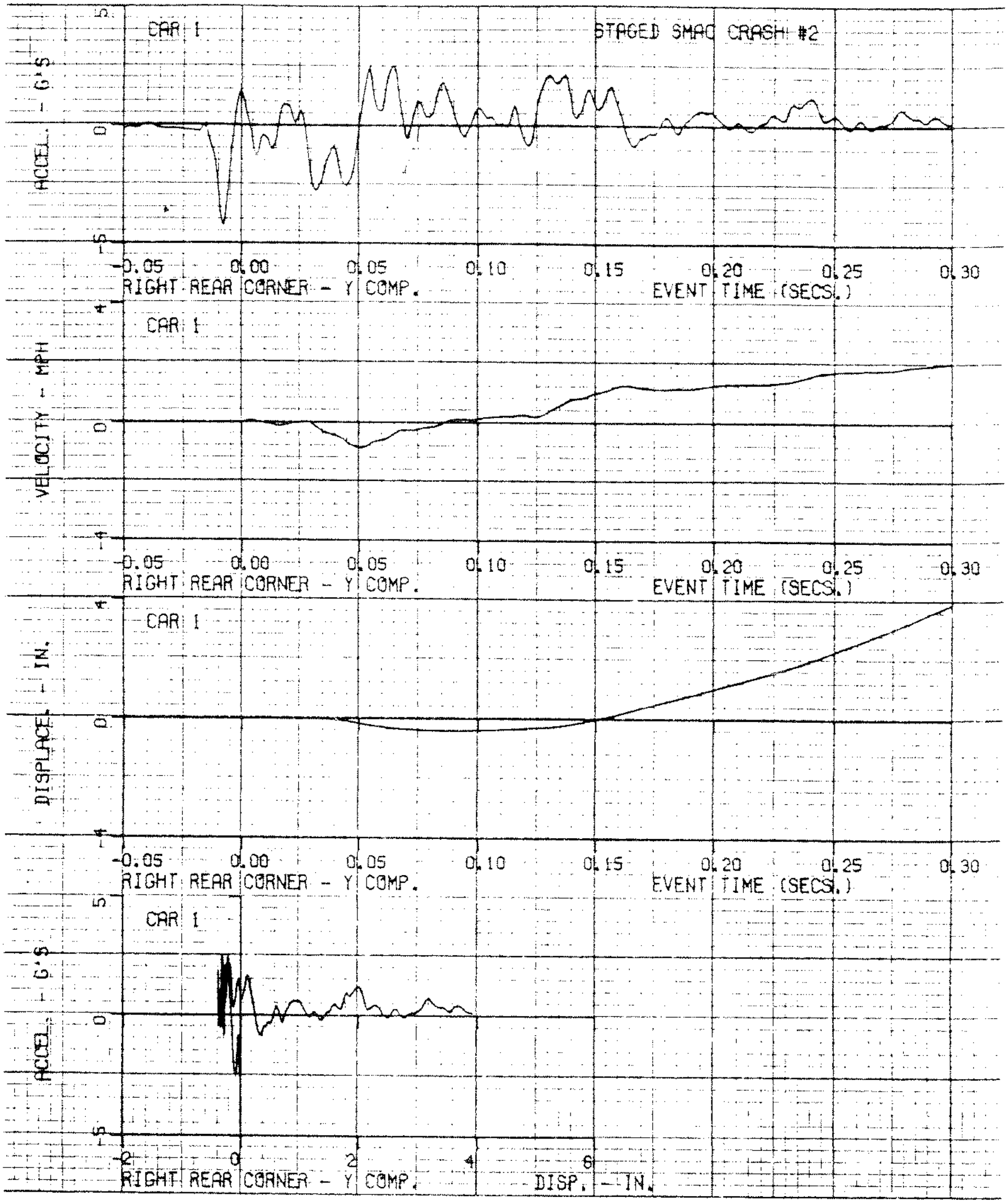

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
100
50
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
0 40 80 120 160
LEFT FRONT CORNER - X COMP.
DISP. - IN.

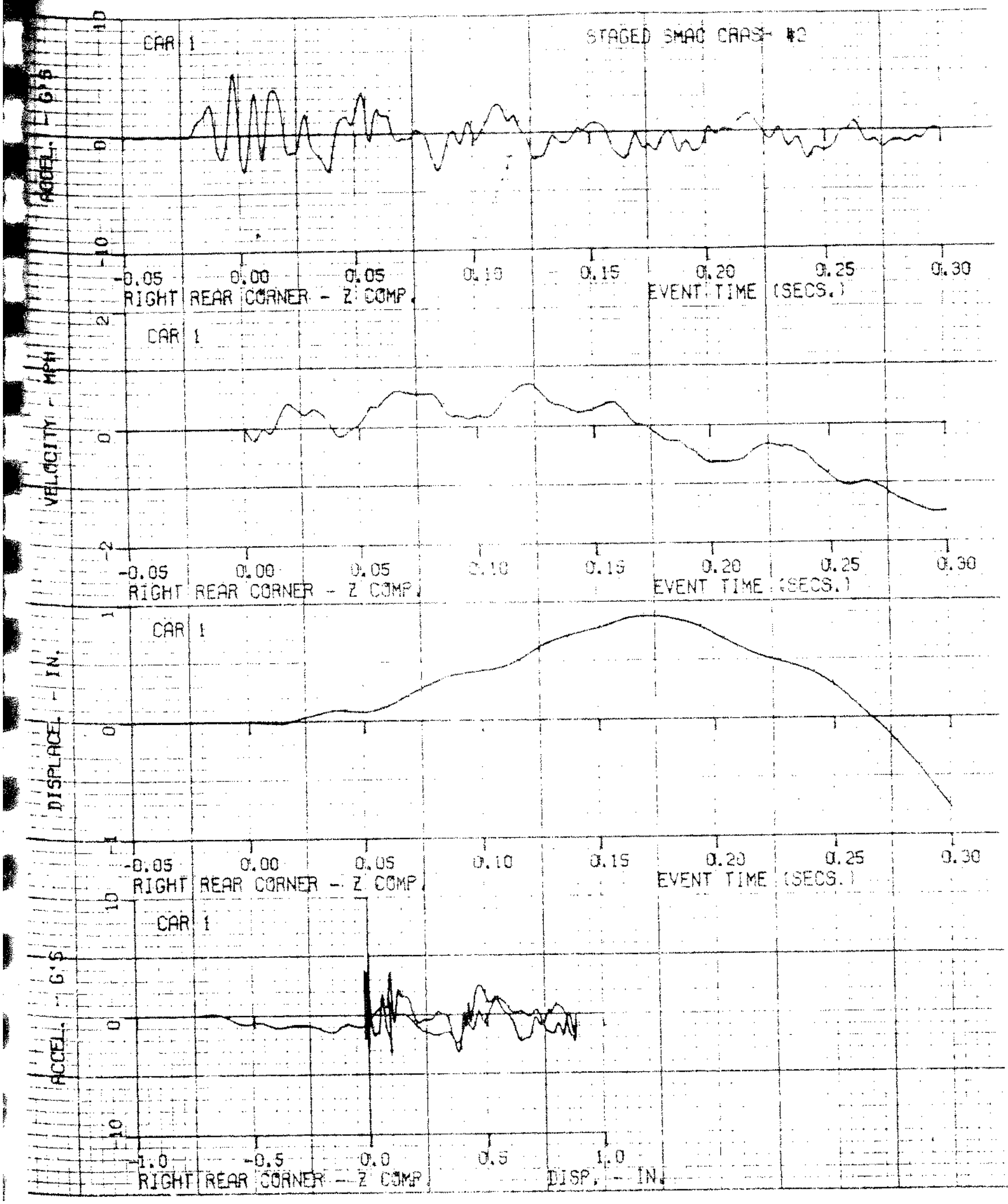

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

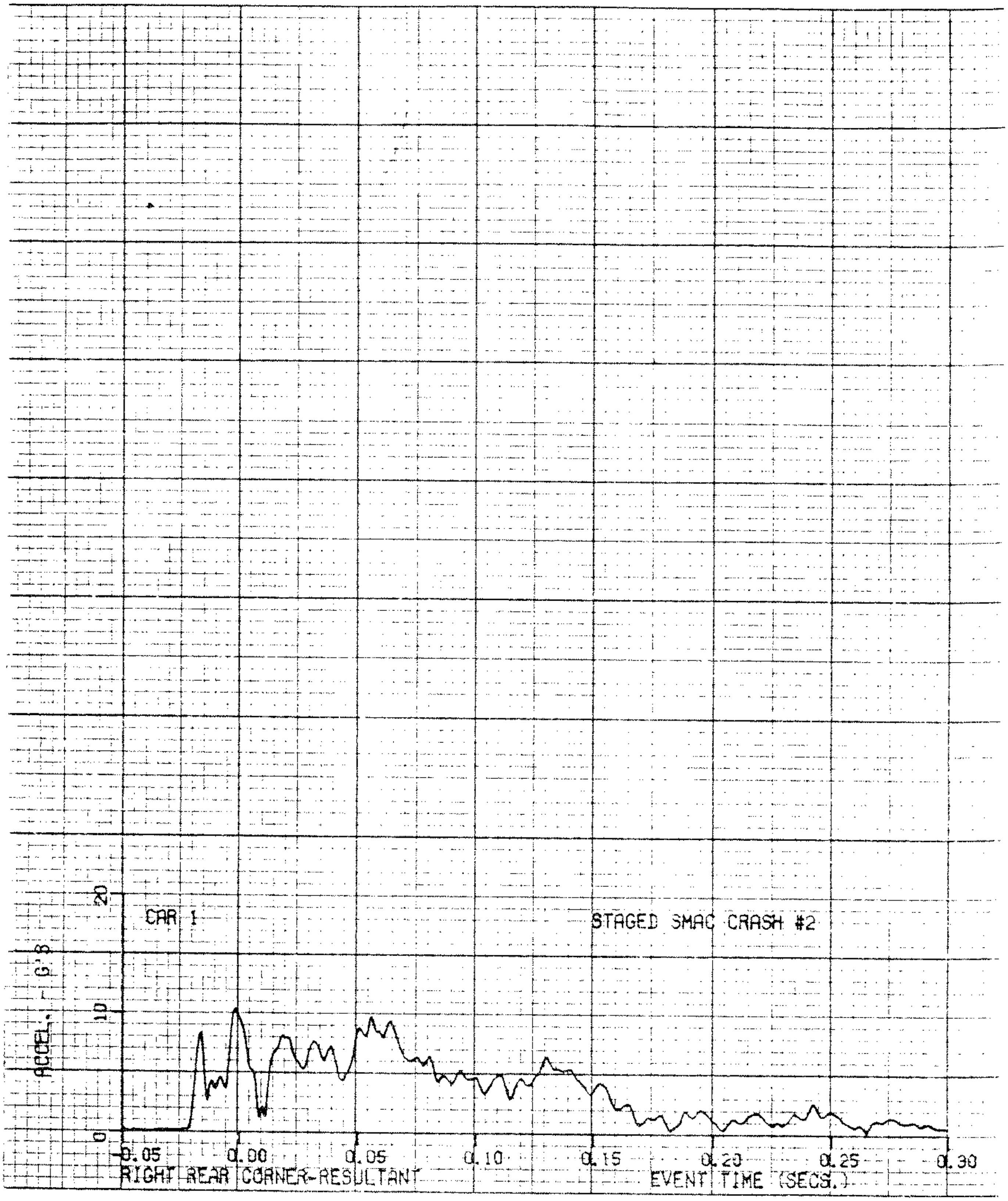

STAGED SMAC CRASH #2
CAR 1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-60
-40
-20
0
20
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

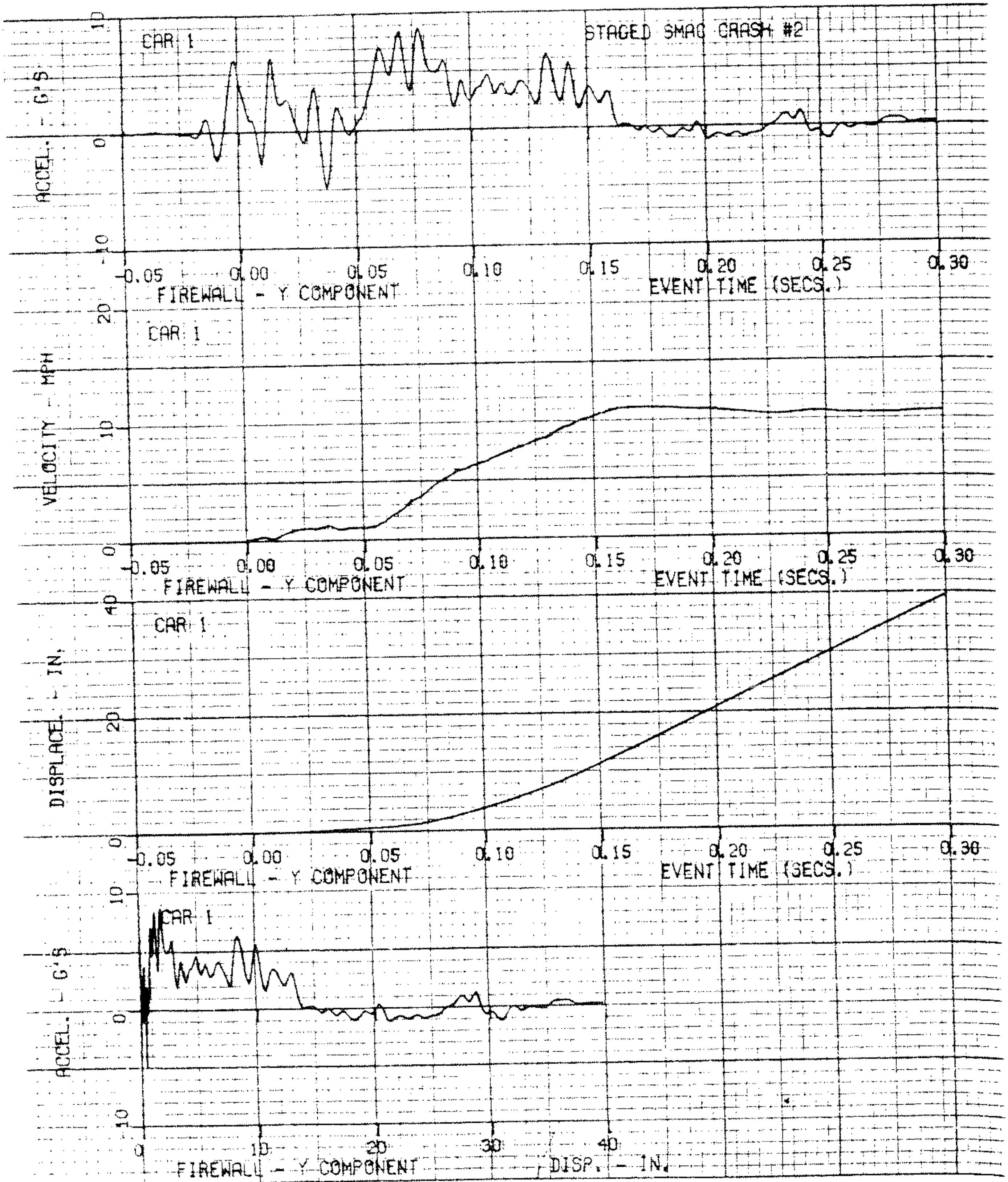

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.3
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
100
50
0
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
40
80
120
160
RIGHT REAR CORNER - X COMP.
DISP. - IN.

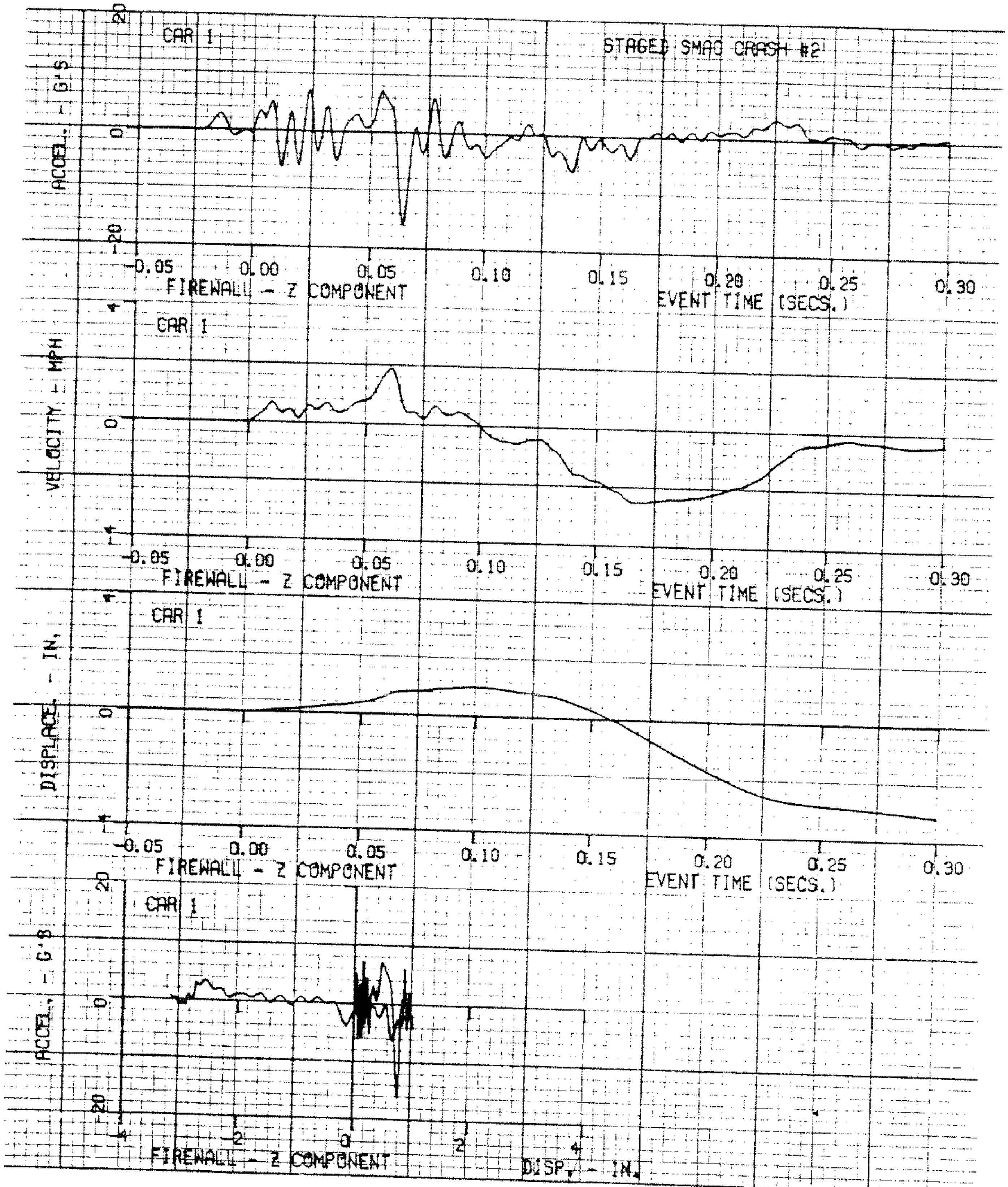

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
5
0
-5
-2
0
2
4
6
RIGHT REAR CORNER - Y COMP.
DISP. - IN.

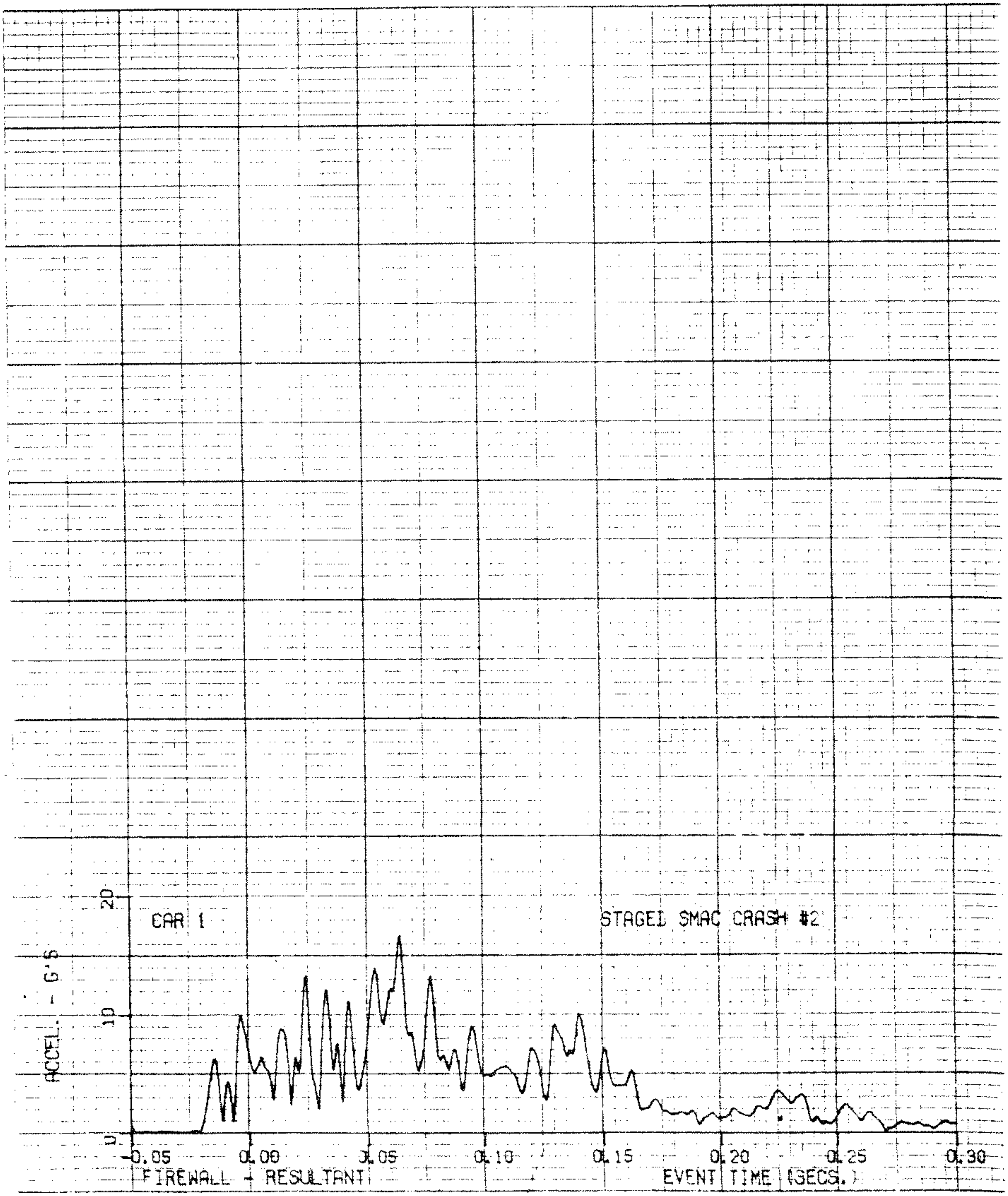

STAGED SMAC CRASH #2
CAR 1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-1.0
-0.5
0.0
0.5
1.0
RIGHT REAR CORNER - Z COMP.
DISP. - IN.


CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
0
10
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER-RESULTANT
EVENT TIME (SECS.)

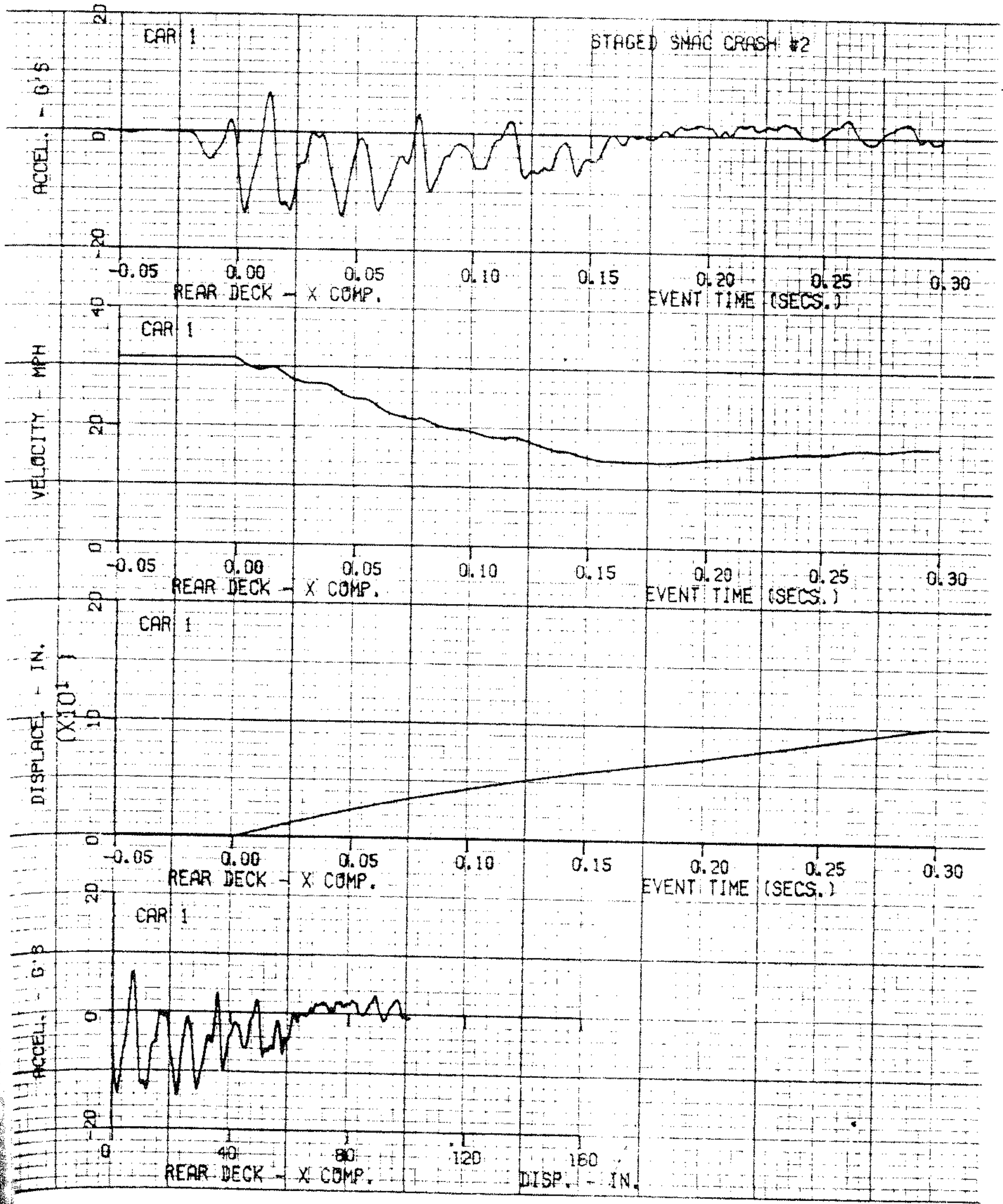


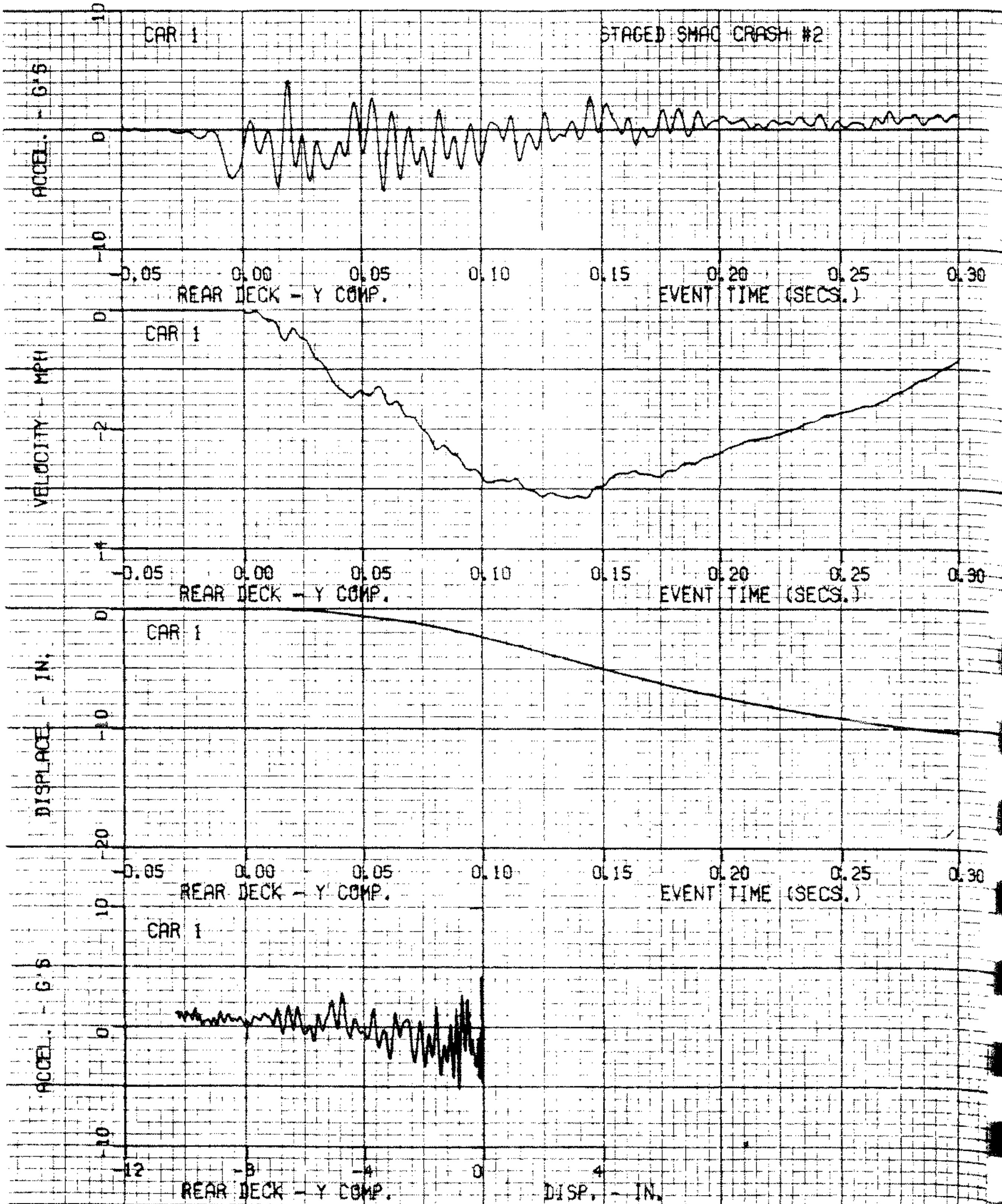
STAGED SMAC CRASH #2
CAR 1
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
20
10
0
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
40
20
0
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
10
0
10
20
30
40
FIREWALL - Y COMPONENT
DISP. - IN.

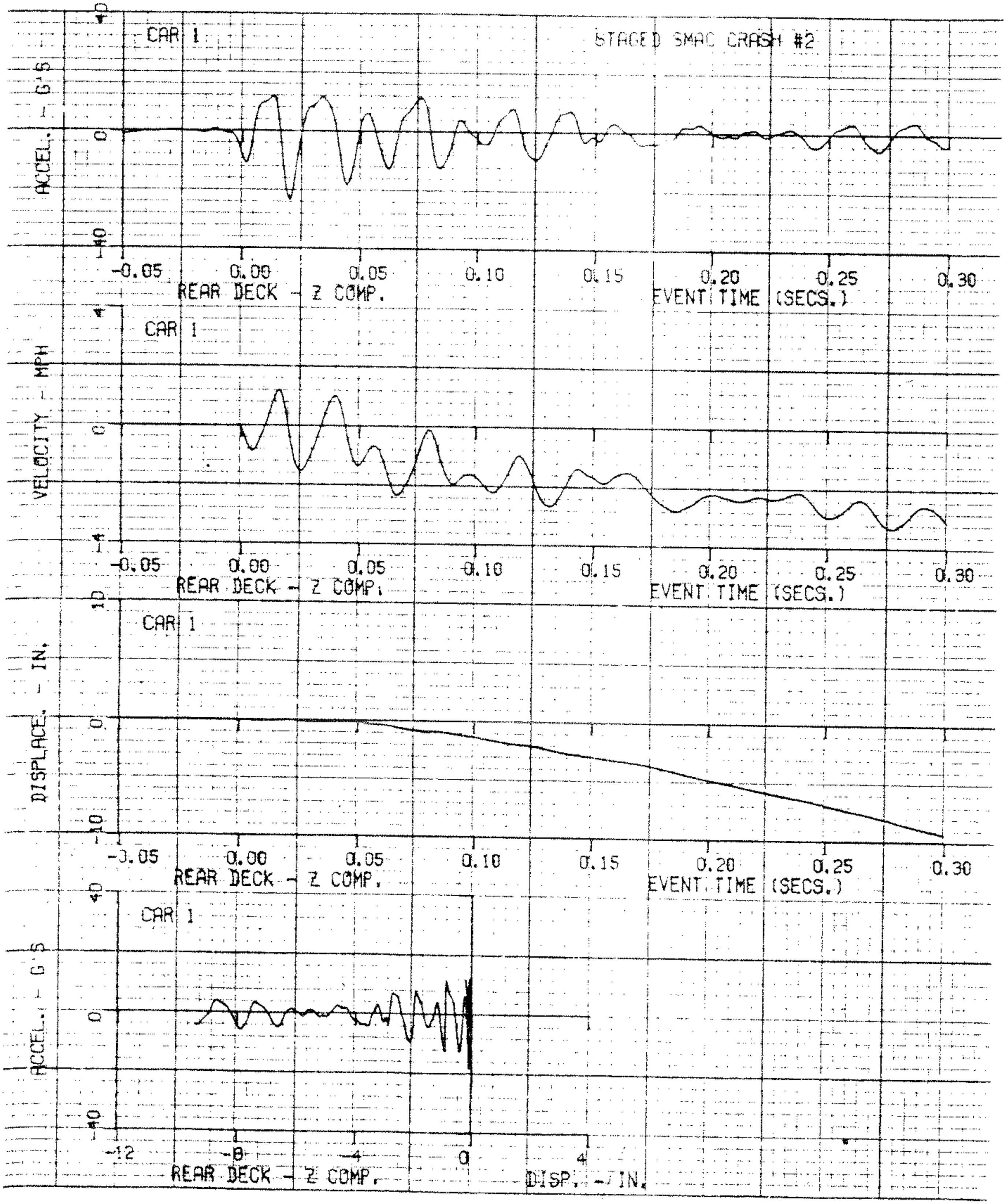

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
4
0
-4
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
-4
-2
0
2
4
FIREWALL - Z COMPONENT
DISP. - IN.

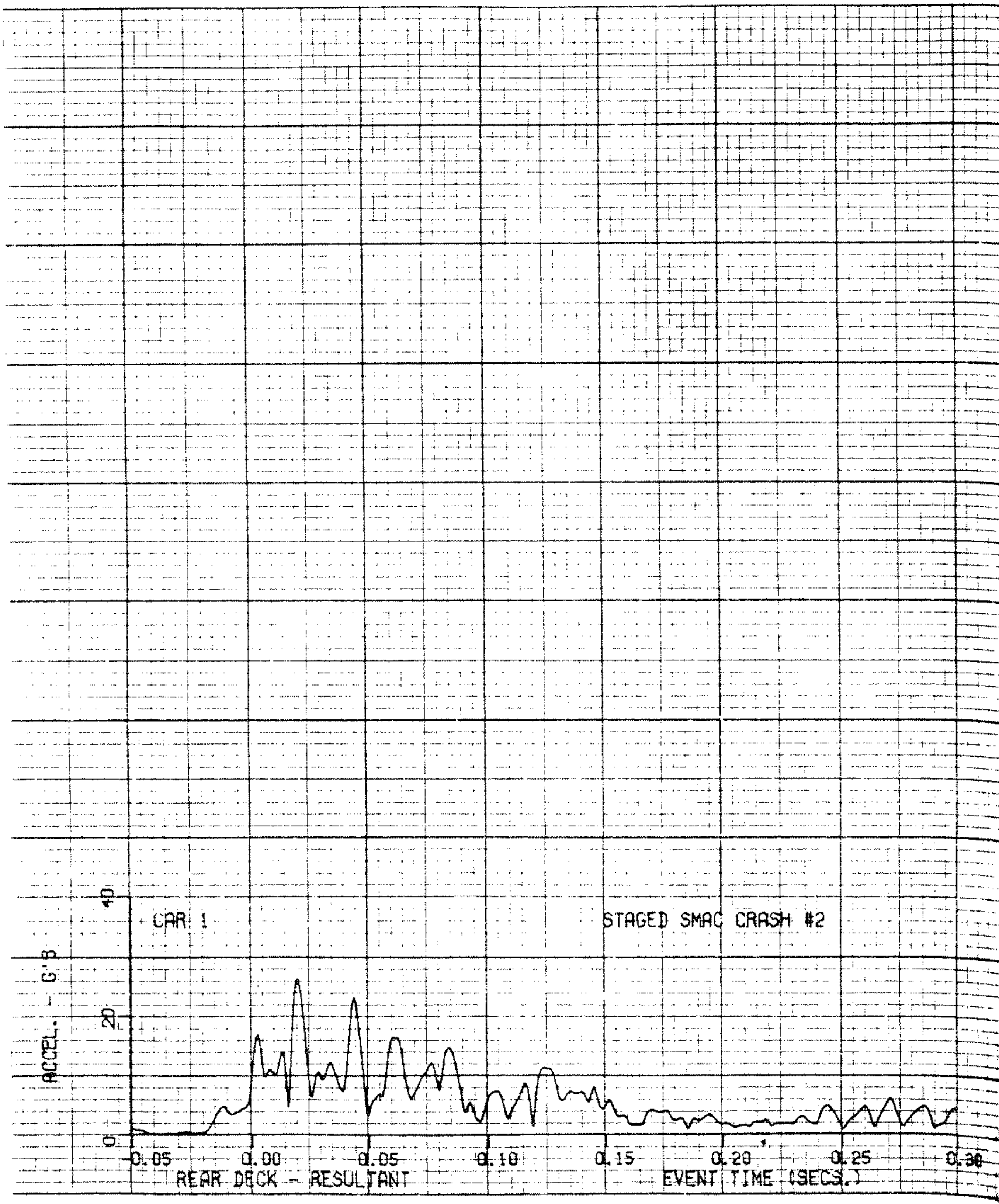

CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)

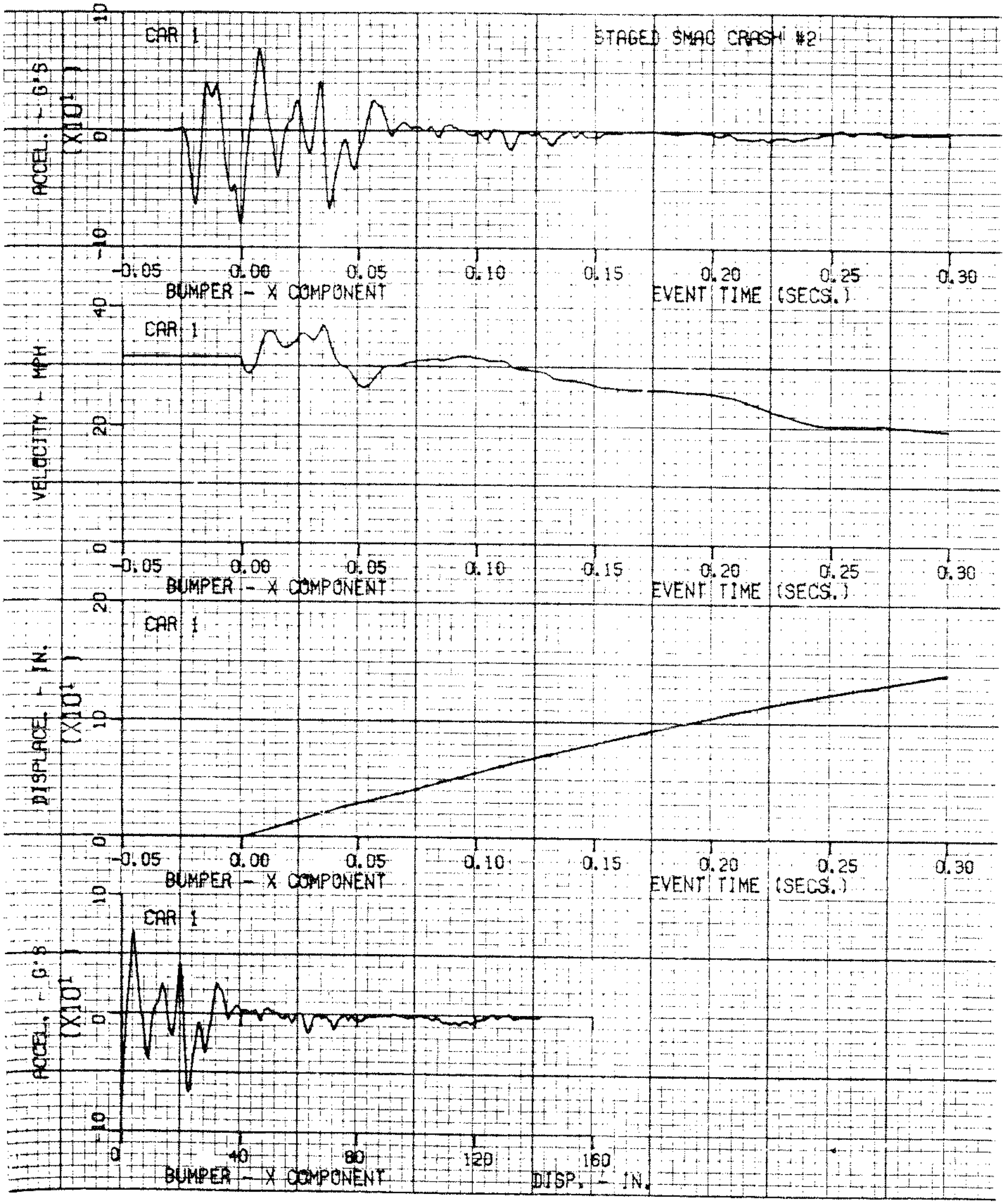
CQ-6057-V-4


CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
(X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
0
40
80
120
160
REAR DECK - X COMP.
DISP. - IN.


CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
CAR 1
0
-2
-4
REAR DECK - Y COMP.
EVENT TIME (SECS.)
DISPLACE. - IN.
CAR 1
0
-10
-20
REAR DECK - Y COMP.
EVENT TIME (SECS.)
ACCEL. - G'S
CAR 1
10
0
-10
-12
-8
-4
0
4
REAR DECK - Y COMP.
DISP. - IN.


STAGED SMAC CRASH #2
CAR 1
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
40
0
-40
-12
-8
-4
0
4
REAR DECK - Z COMP.
DISP. - IN.


CAR 1
STAGED SMAC CRASH #2
ACCEL. - G'S
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)


STAGED SMAC CRASH #2
CAR 1
ACCEL. - G'S (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN. (X10¹)
20
10
0
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S (X10¹)
0
40
80
120
160
BUMPER - X COMPONENT
DISP. - IN.

RICSAC TEST NO. 2

VEHICLE RESPONSES

CAR NO. 2 PINTO

DATA PLOTS

ACCELERATION TIME HISTORIES

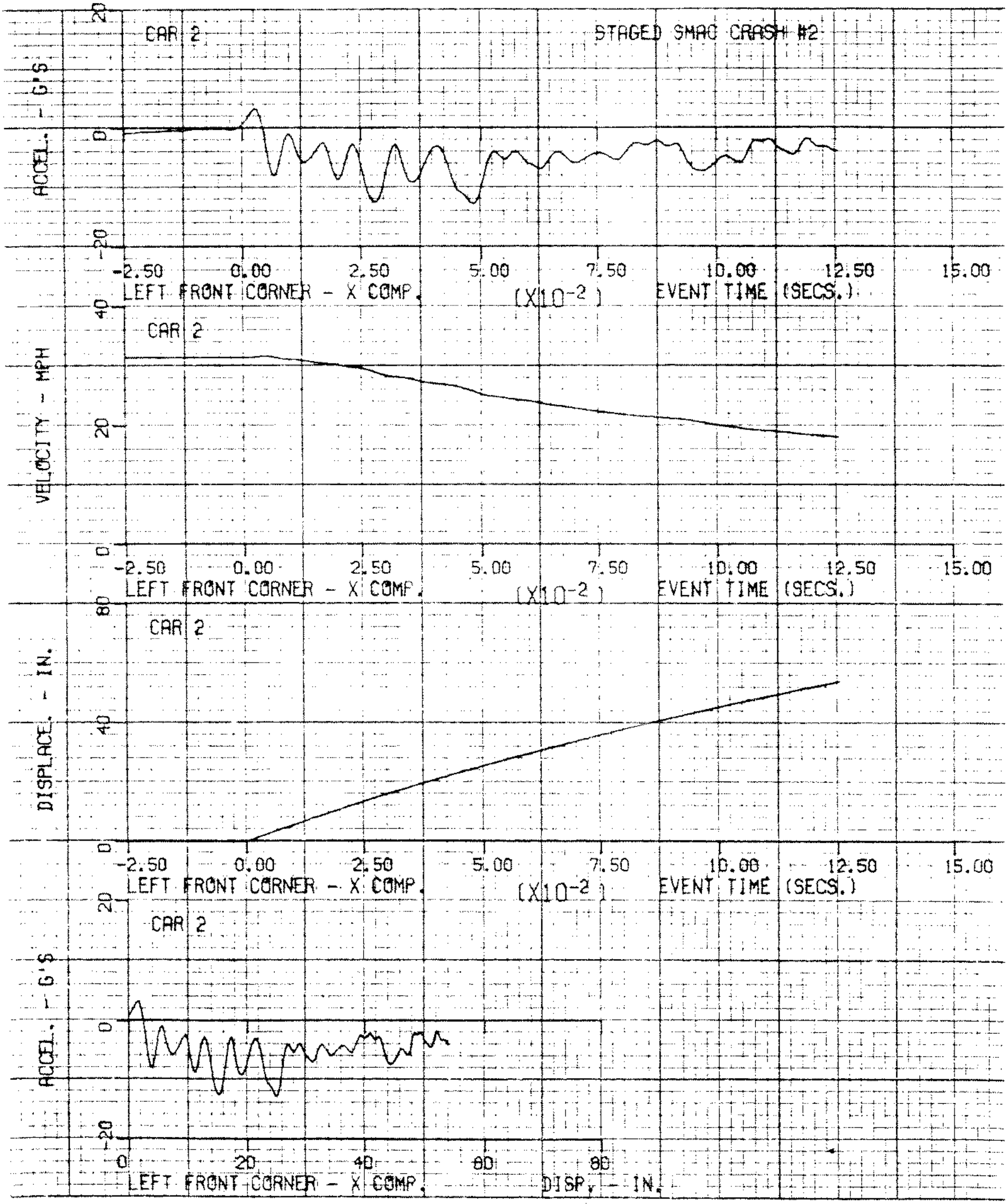
VELOCITY TIME HISTORIES

DISPLACEMENT TIME HISTORIES

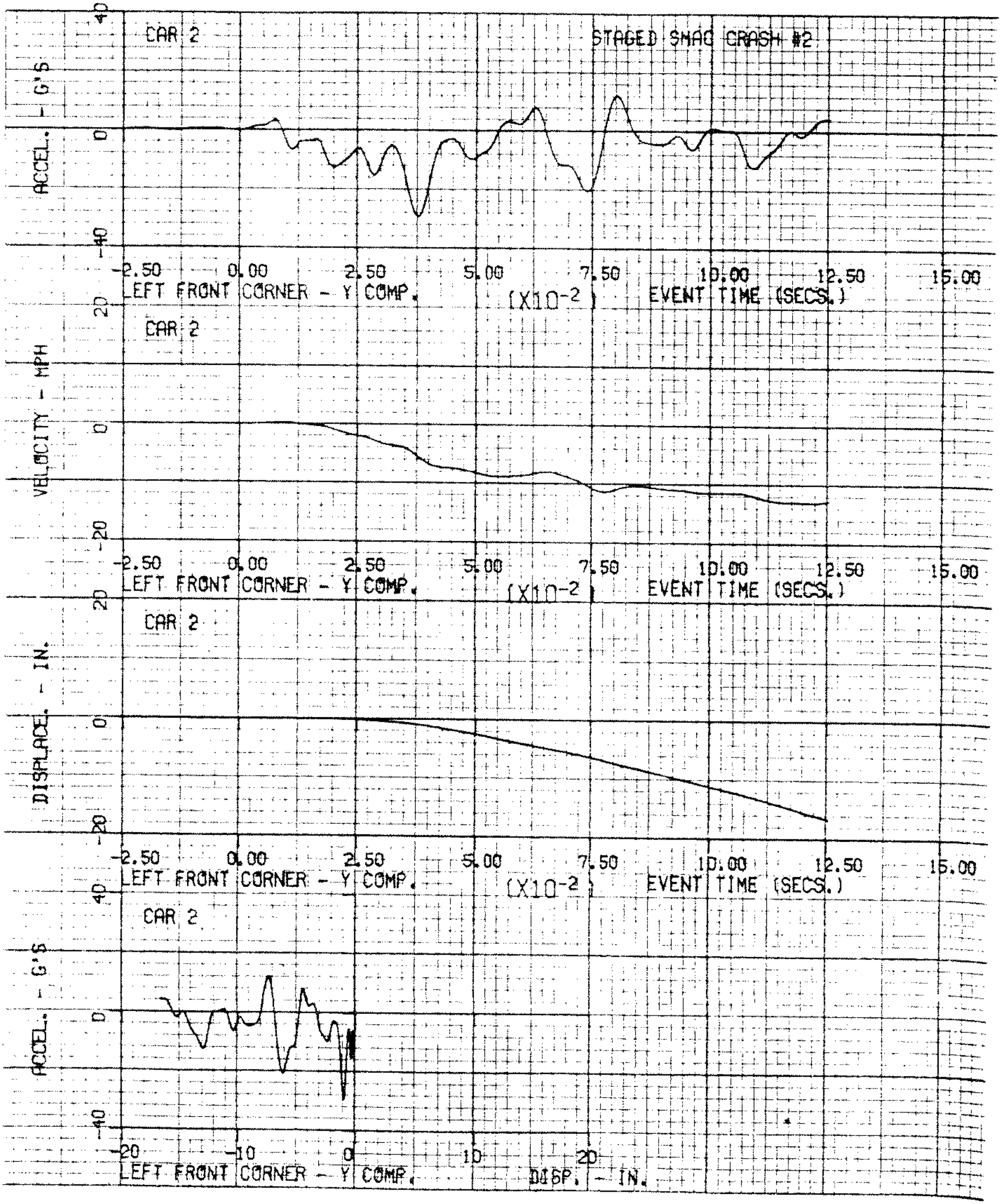
ACCELERATION VS DISPLACEMENT

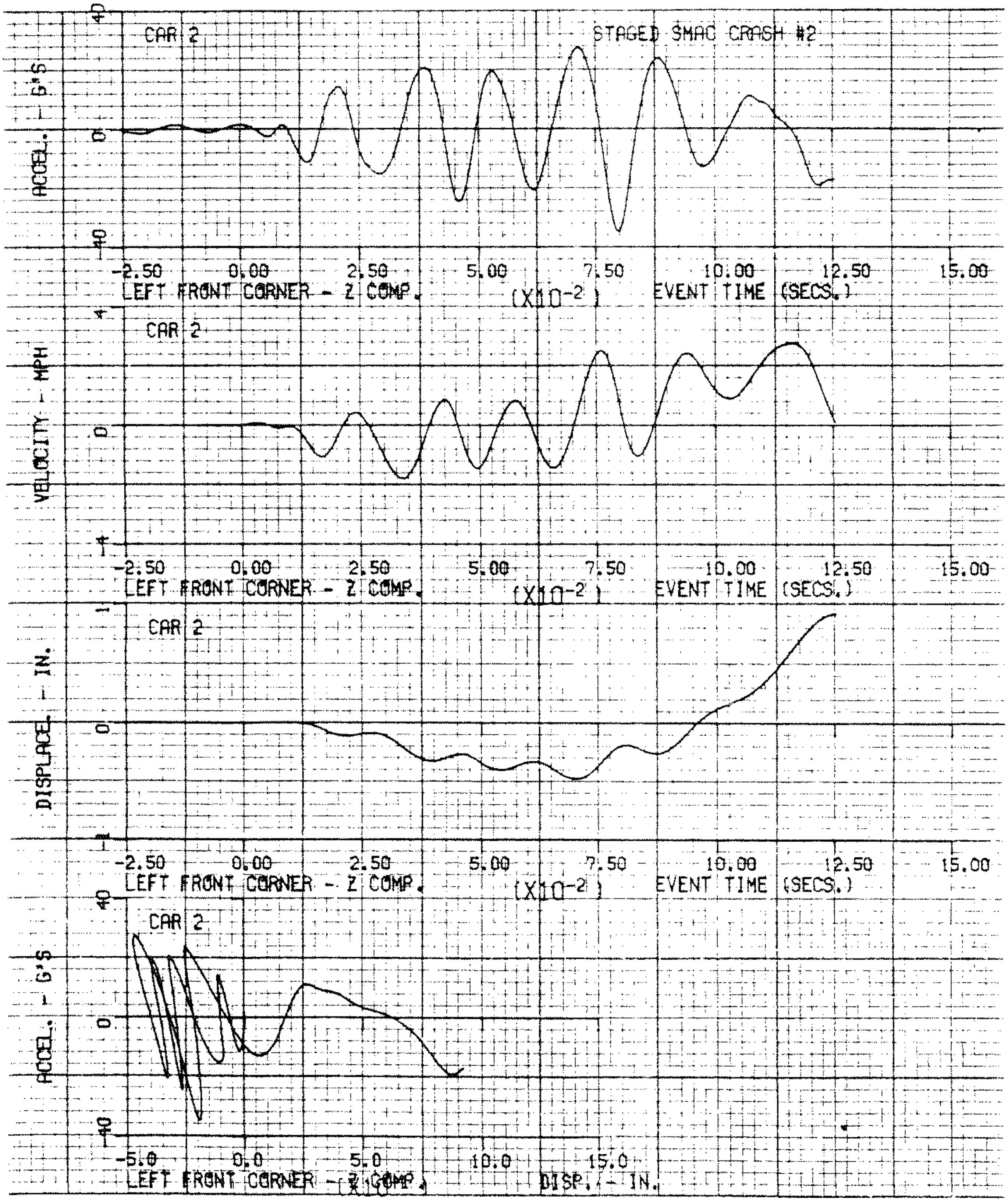
FILTER CLASS 60

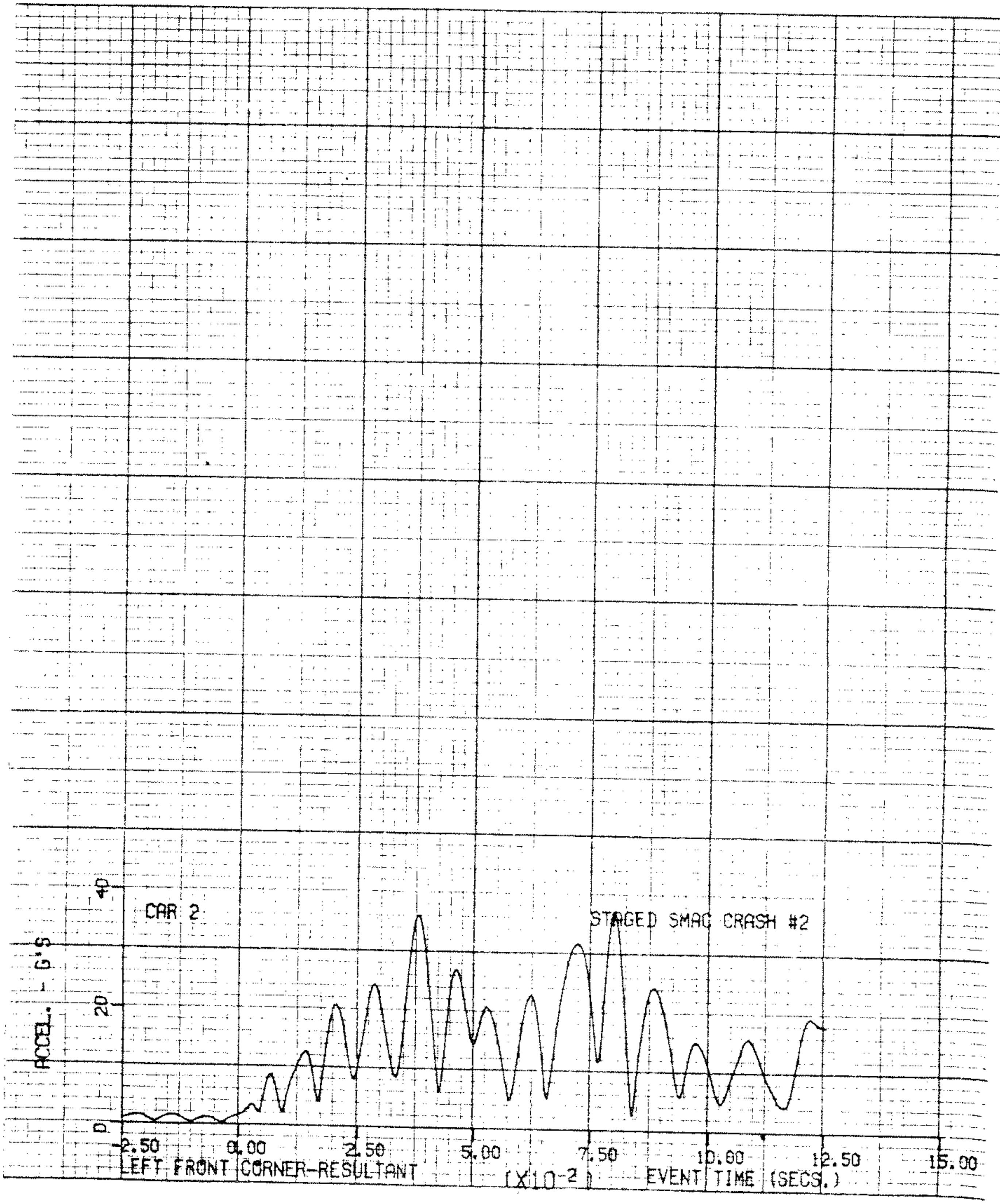
DATA PROCESSED TO ONLY 150 MILLISECONDS
DATA BEYOND THIS POINT WAS CONTAMINATED

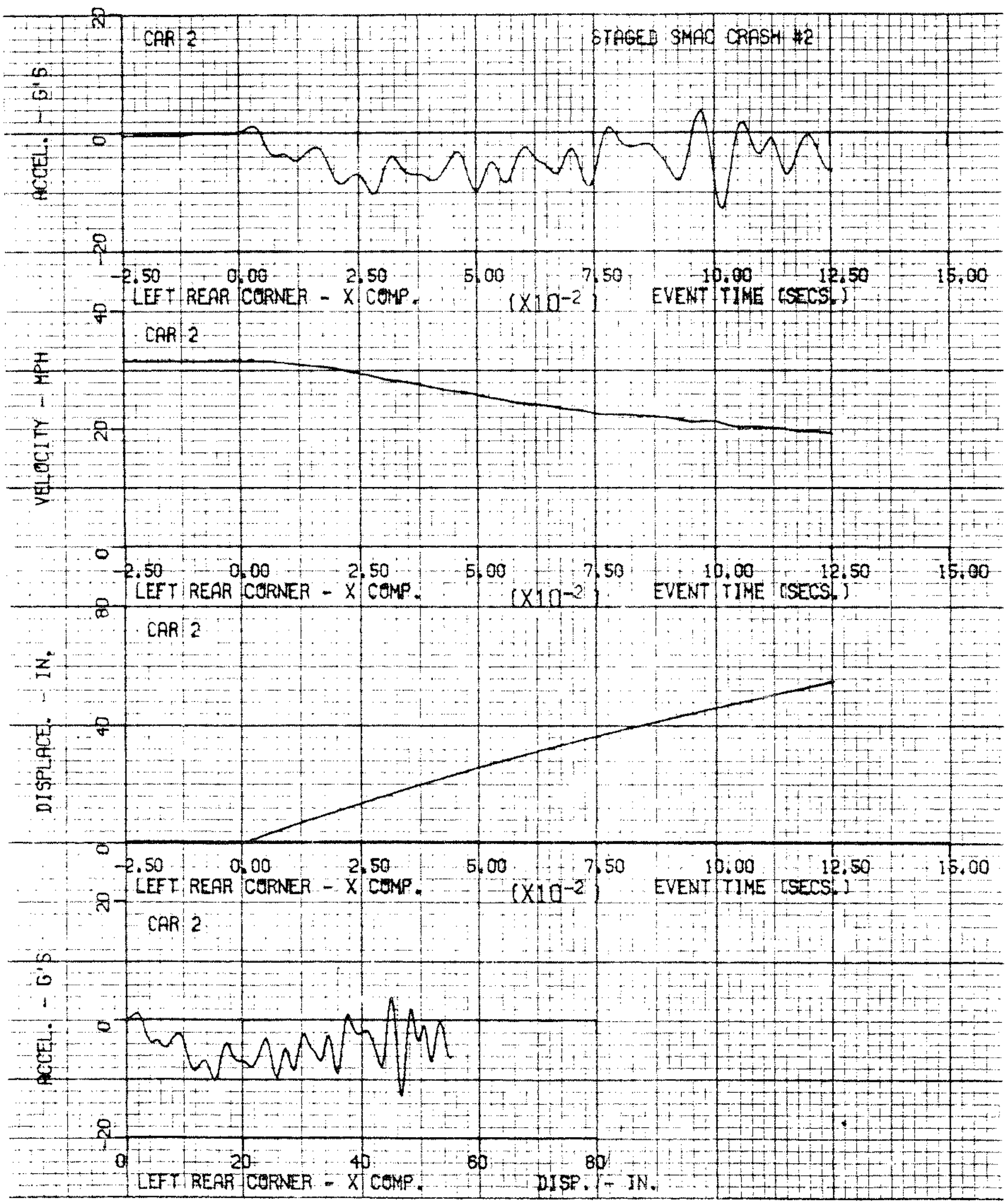


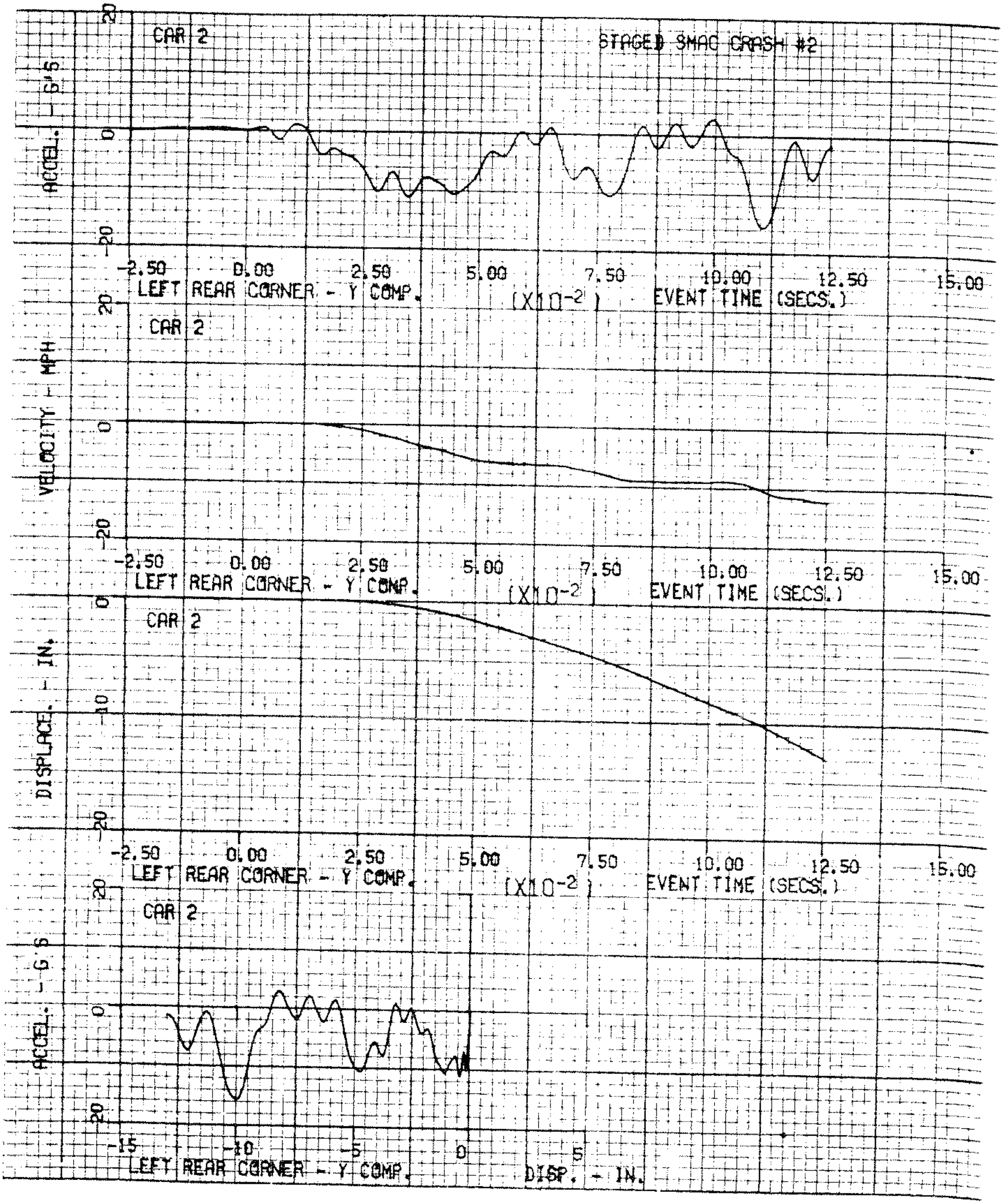
CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
LEFT FRONT CORNER - X COMP.
DISP. - IN.

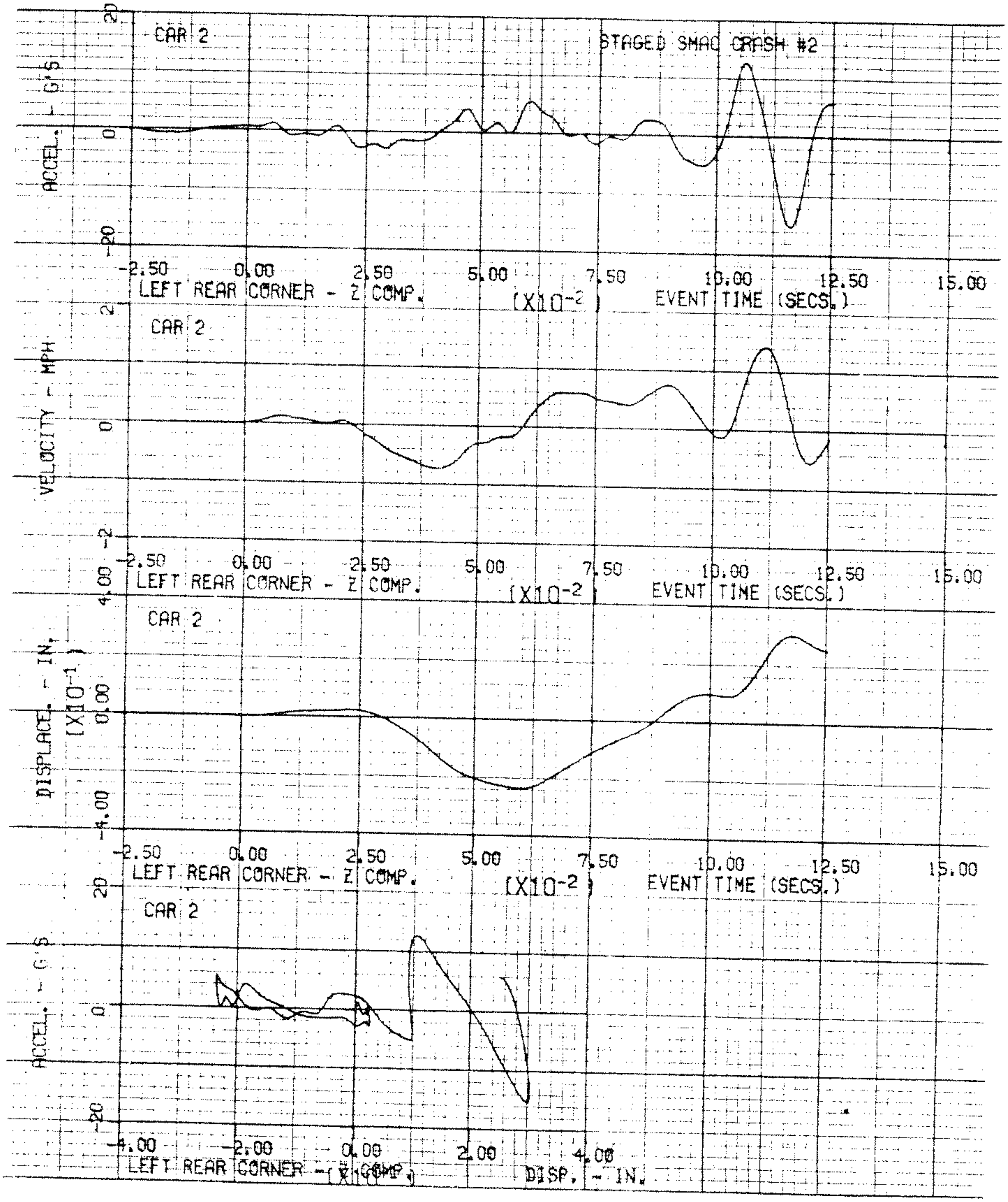

STAGED SNAG CRASH #2
CAR 2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-20
-10
0
10
20
LEFT FRONT CORNER - Y COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
1
0
-1
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-5.0
0.0
5.0
10.0
15.0
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

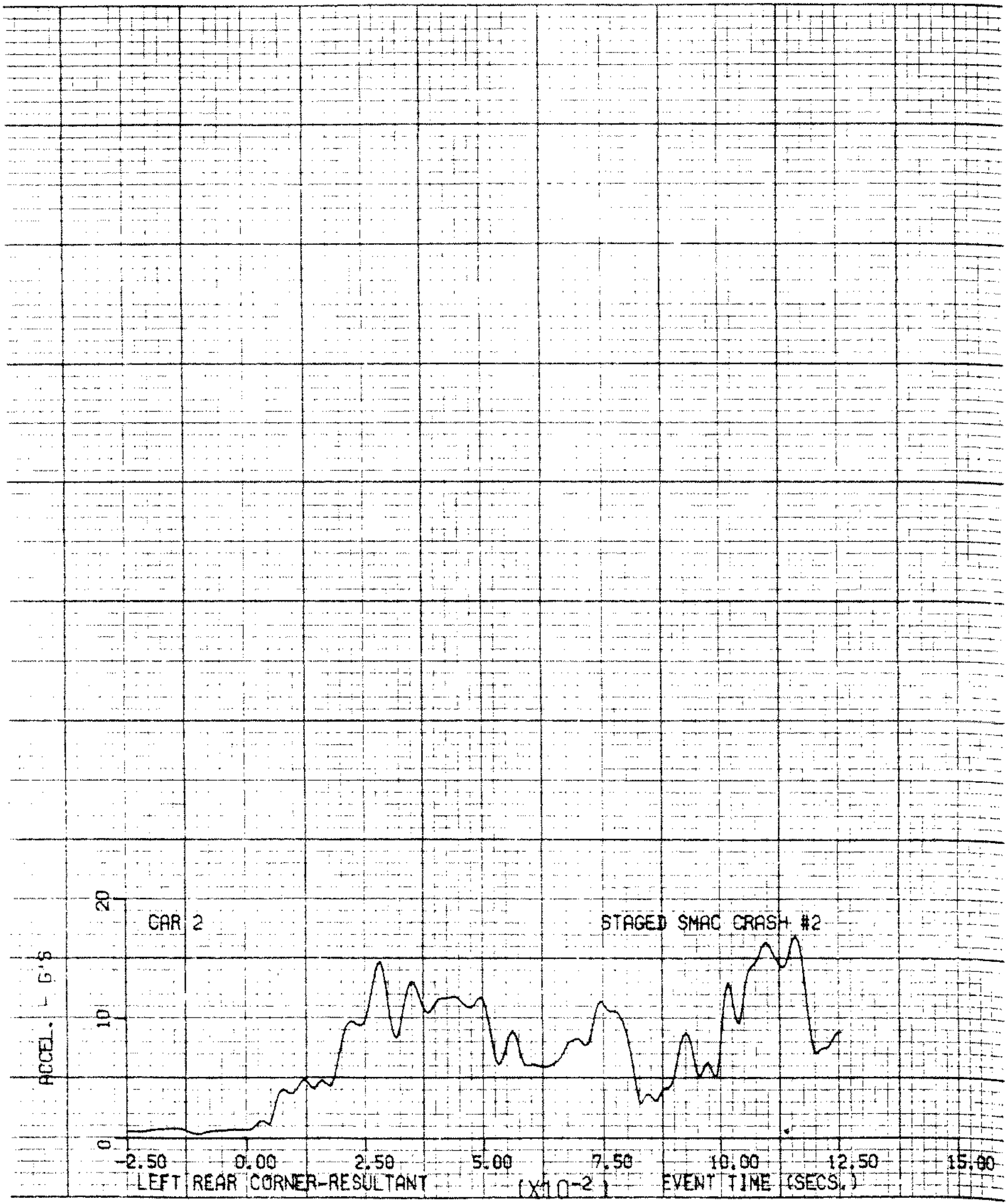

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
20
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT CORNER-RESULTANT
(X10^{-2})
EVENT TIME (SECS.)

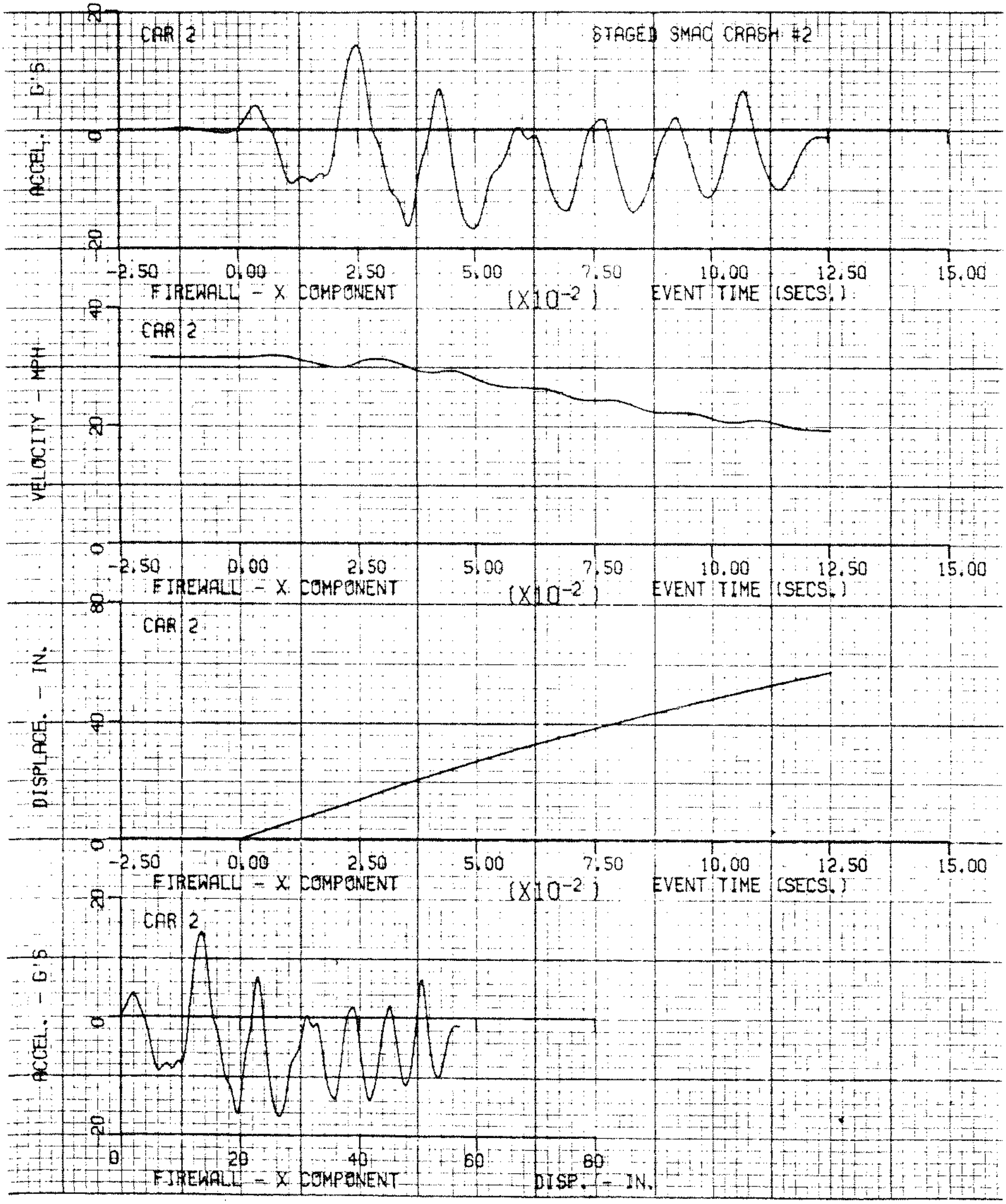

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT REAR CORNER - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
LEFT REAR CORNER - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
LEFT REAR CORNER - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
LEFT REAR CORNER - X COMP.
DISP. - IN.

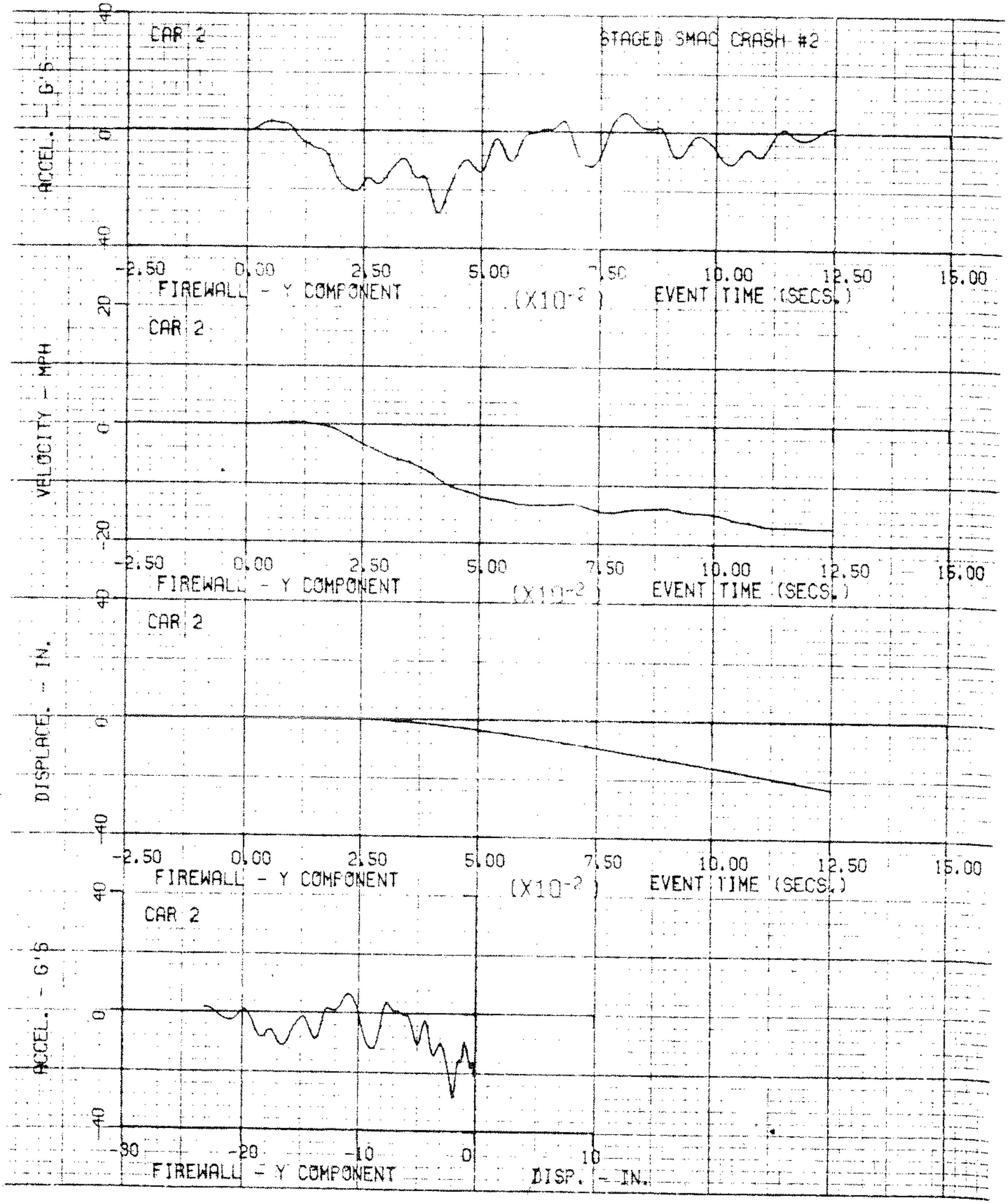

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
LEFT REAR CORNER - Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
ACCEL. - G'S
DISP. - IN.

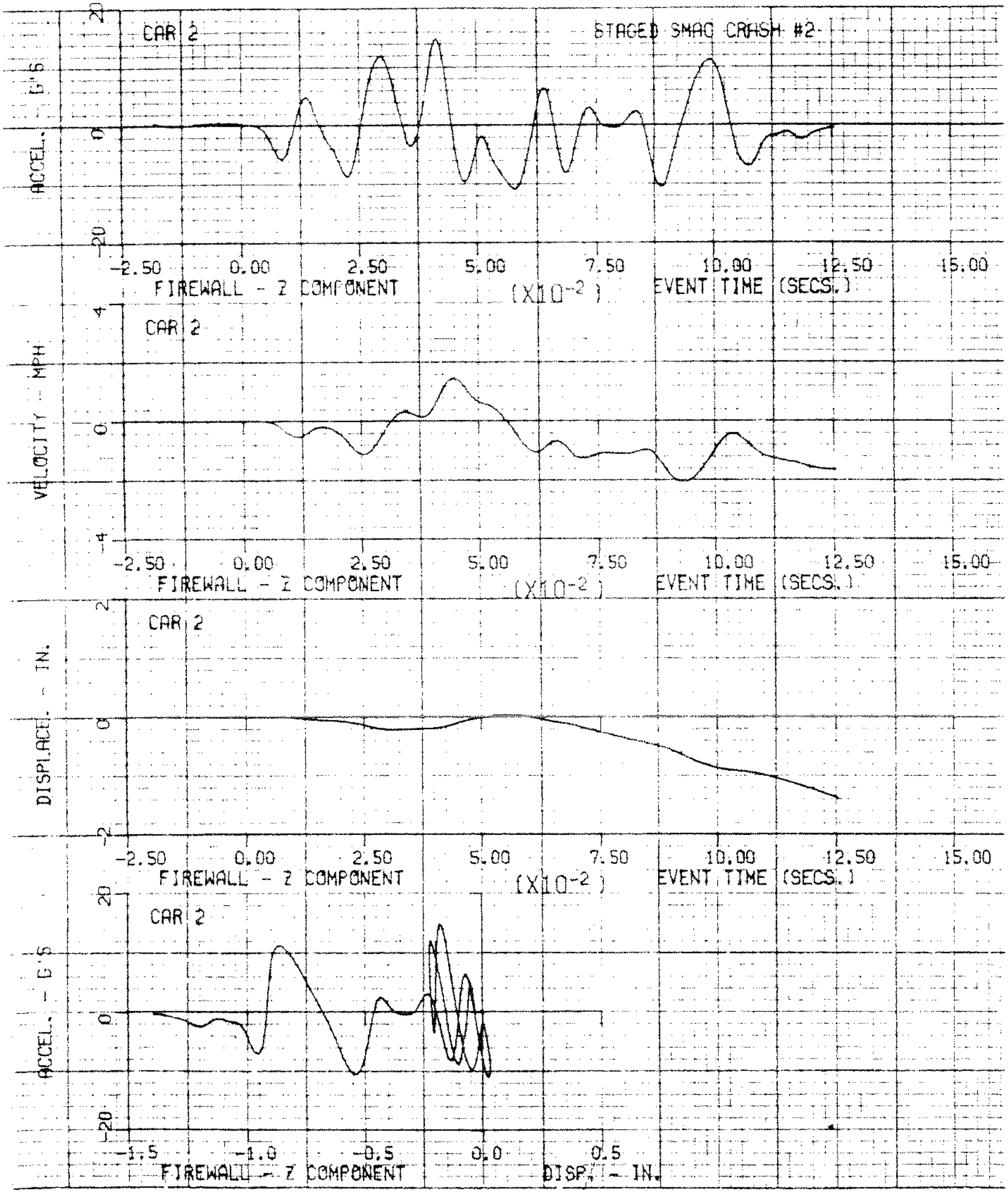


STAGED SMAC CRASH #2
CAR 2
ACCEL. - G'S
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT REAR CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
2
0
-2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT REAR CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10^-1)
4.00
0.00
-4.00
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT REAR CORNER - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-4.00
-2.00
0.00
2.00
4.00
LEFT REAR CORNER - Z COMP.
(X10^-1)
DISP. - IN.

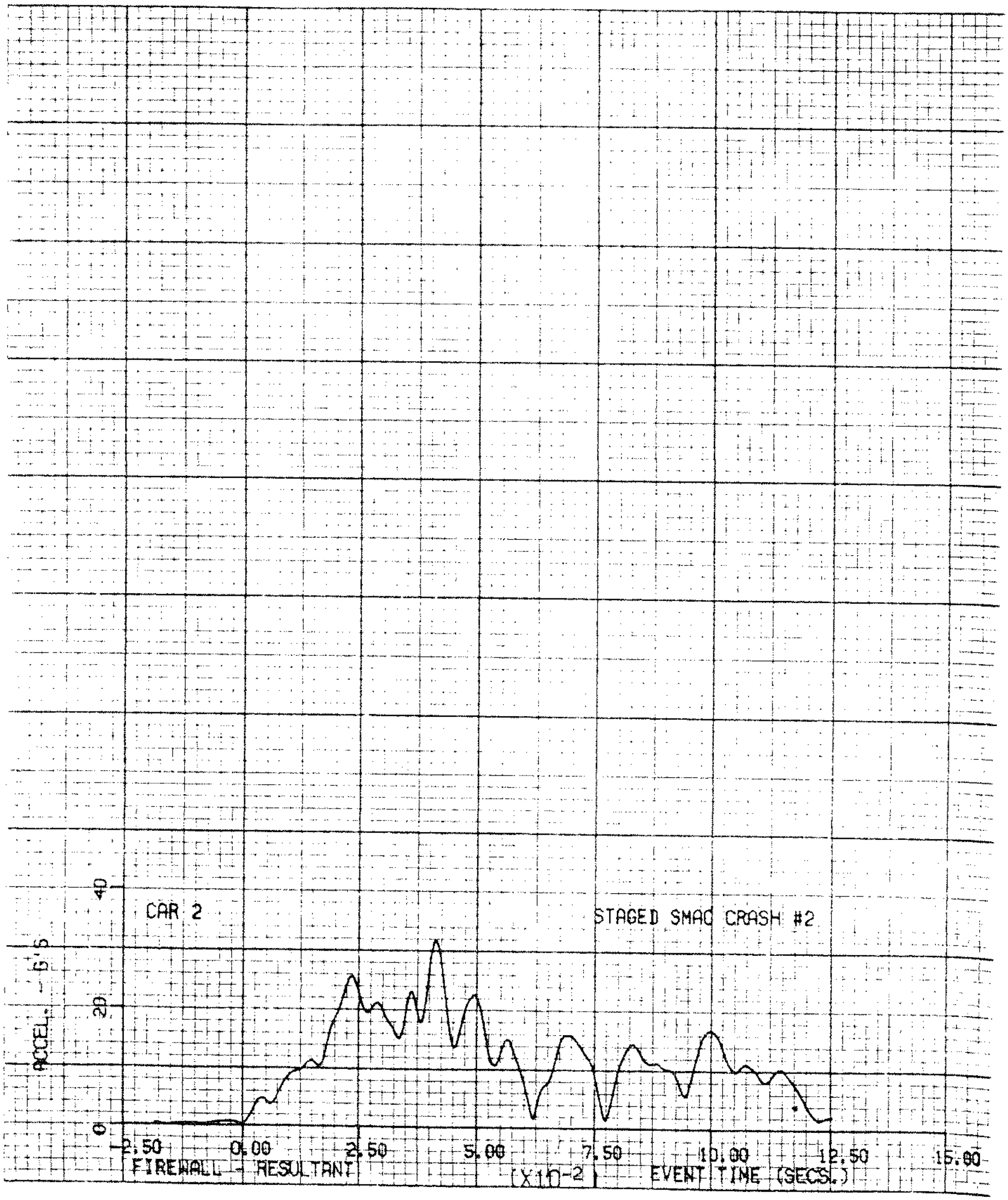

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
10
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT REAR CORNER-RESULTANT
(X10^-2)
EVENT TIME (SECS.)

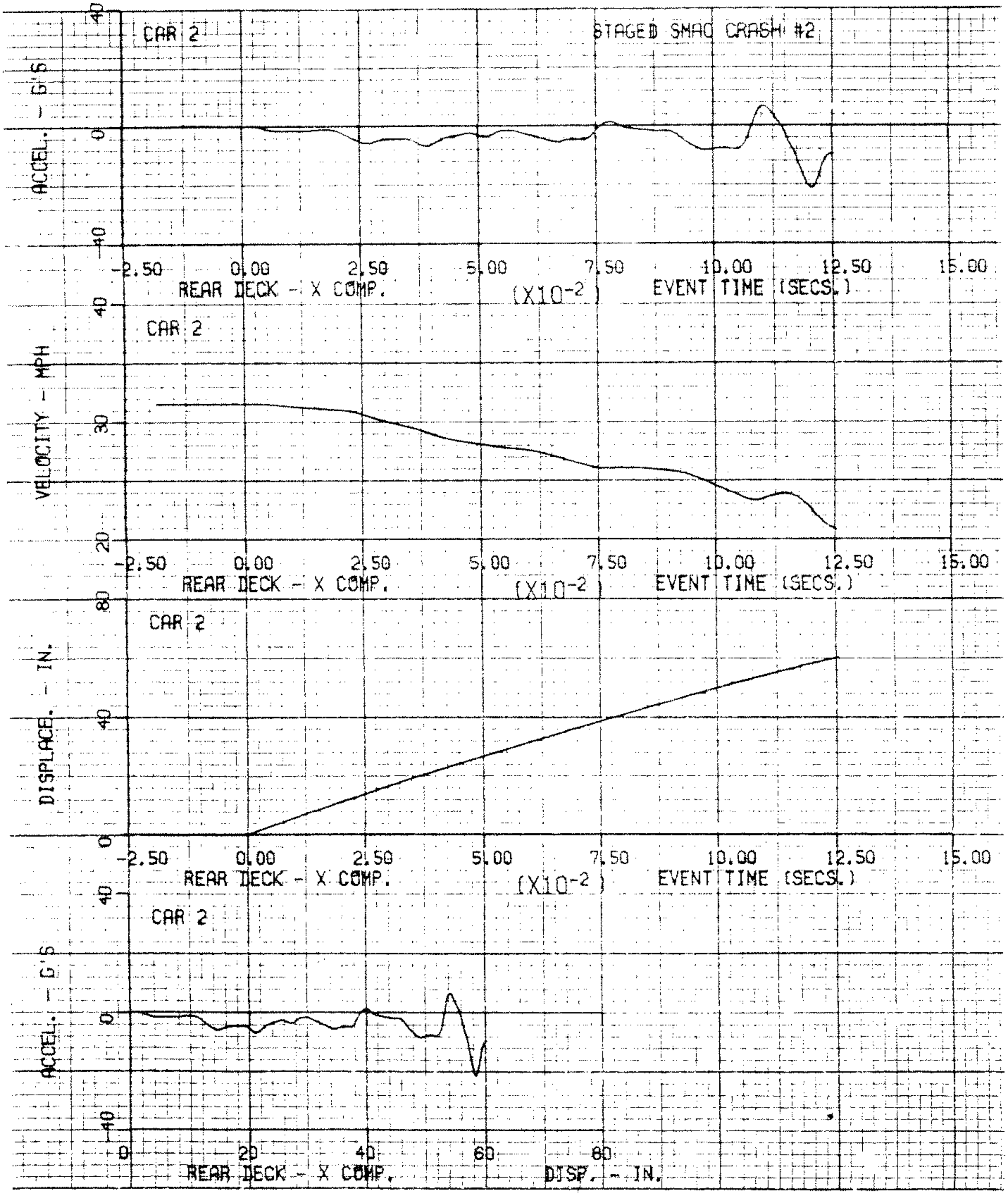

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - X COMPONENT
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - X COMPONENT
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - X COMPONENT
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
20
0
20
40
60
80
FIREWALL - X COMPONENT
DISP. - IN.

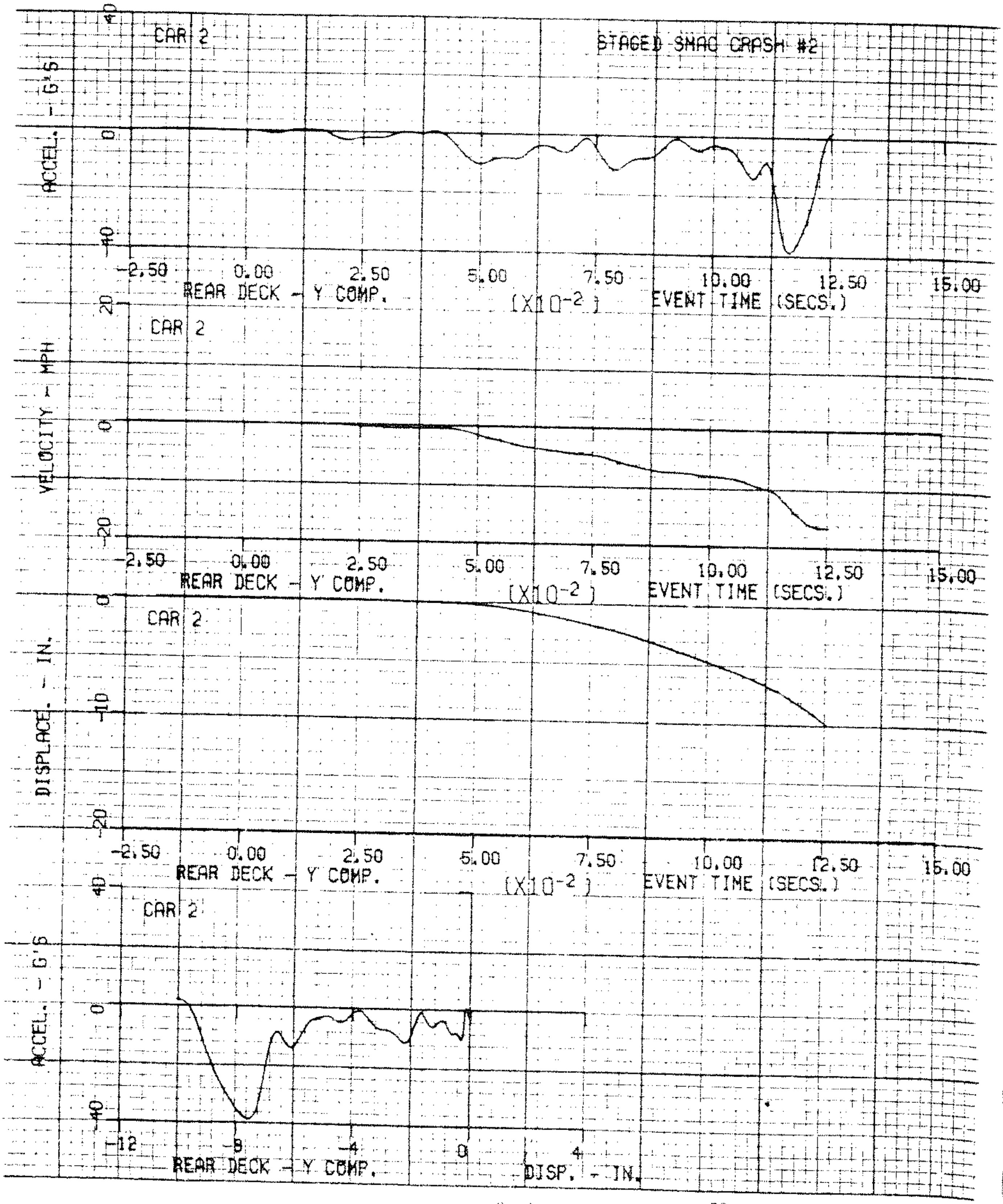

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Y COMPONENT
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Y COMPONENT
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Y COMPONENT
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-30
-20
-10
0
10
FIREWALL - Y COMPONENT
DISP. - IN.



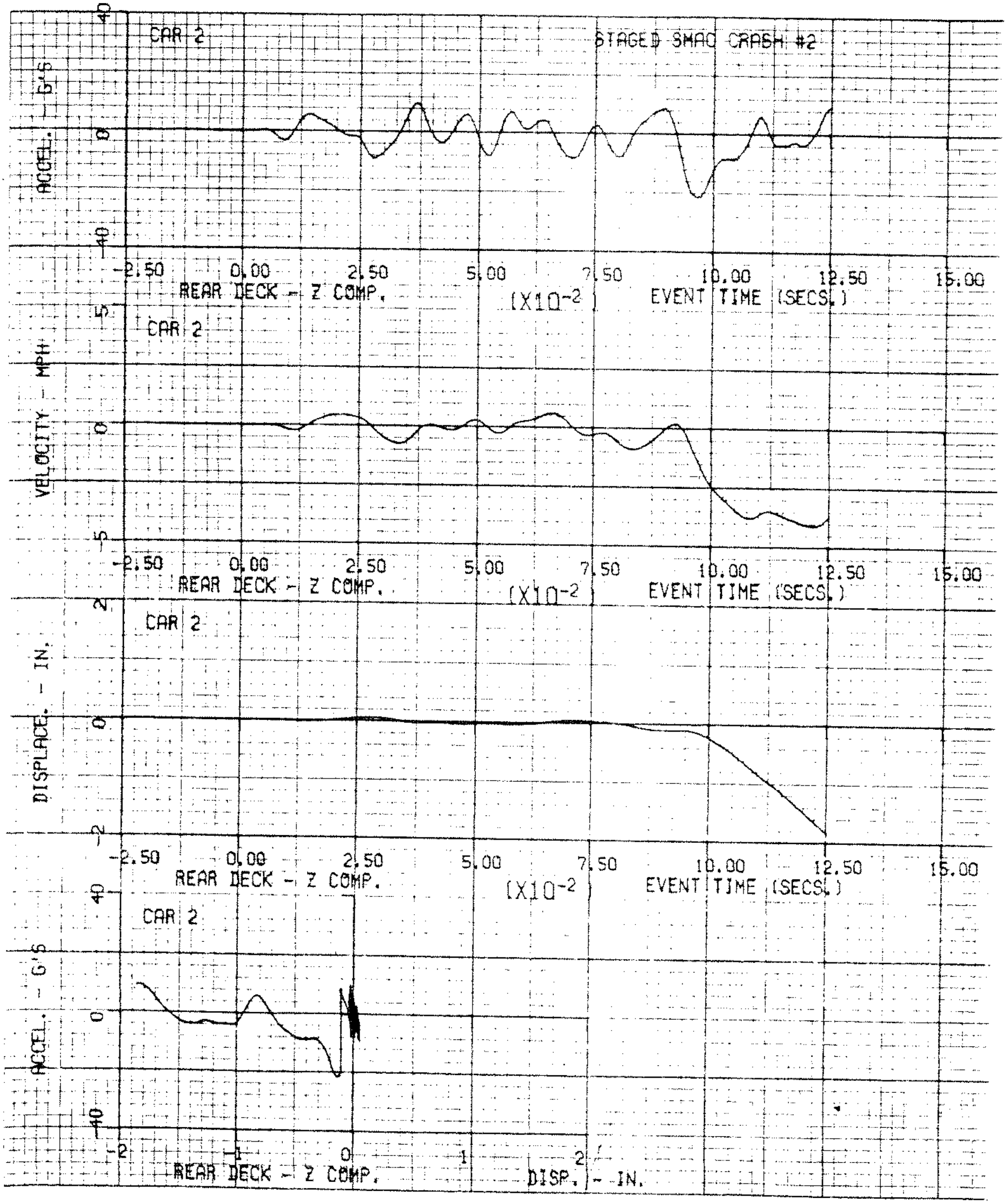
CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Z COMPONENT
(X10-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Z COMPONENT
(X10-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
2
0
-2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - Z COMPONENT
(X10-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-1.5
-1.0
-0.5
0.0
0.5
FIREWALL - Z COMPONENT
DISP. - IN.

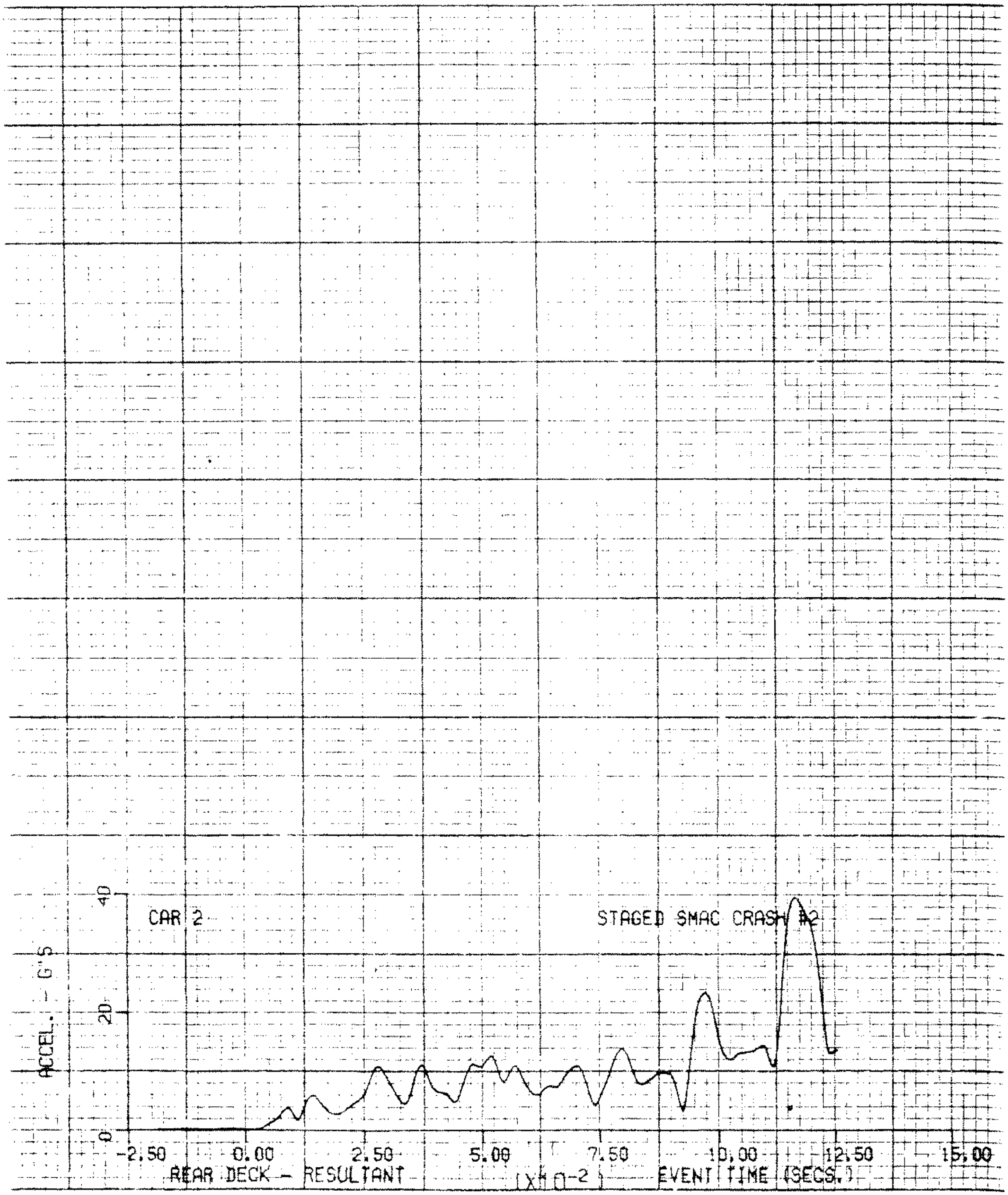

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
20
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
FIREWALL - RESULTANT
(X10-2)
EVENT TIME (SECS.)

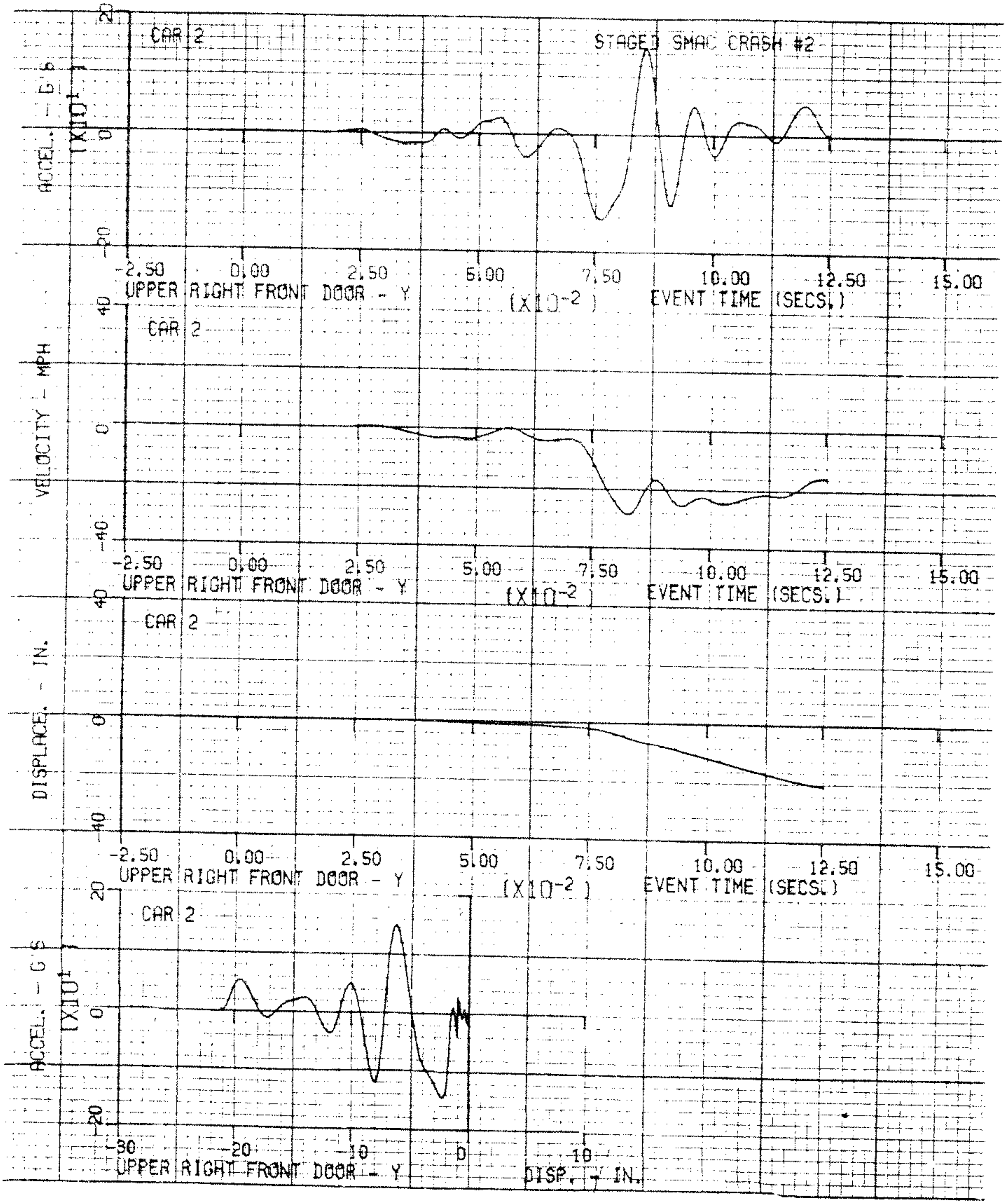

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
30
20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
20
40
60
80
REAR DECK - X COMP.
DISP. - IN.

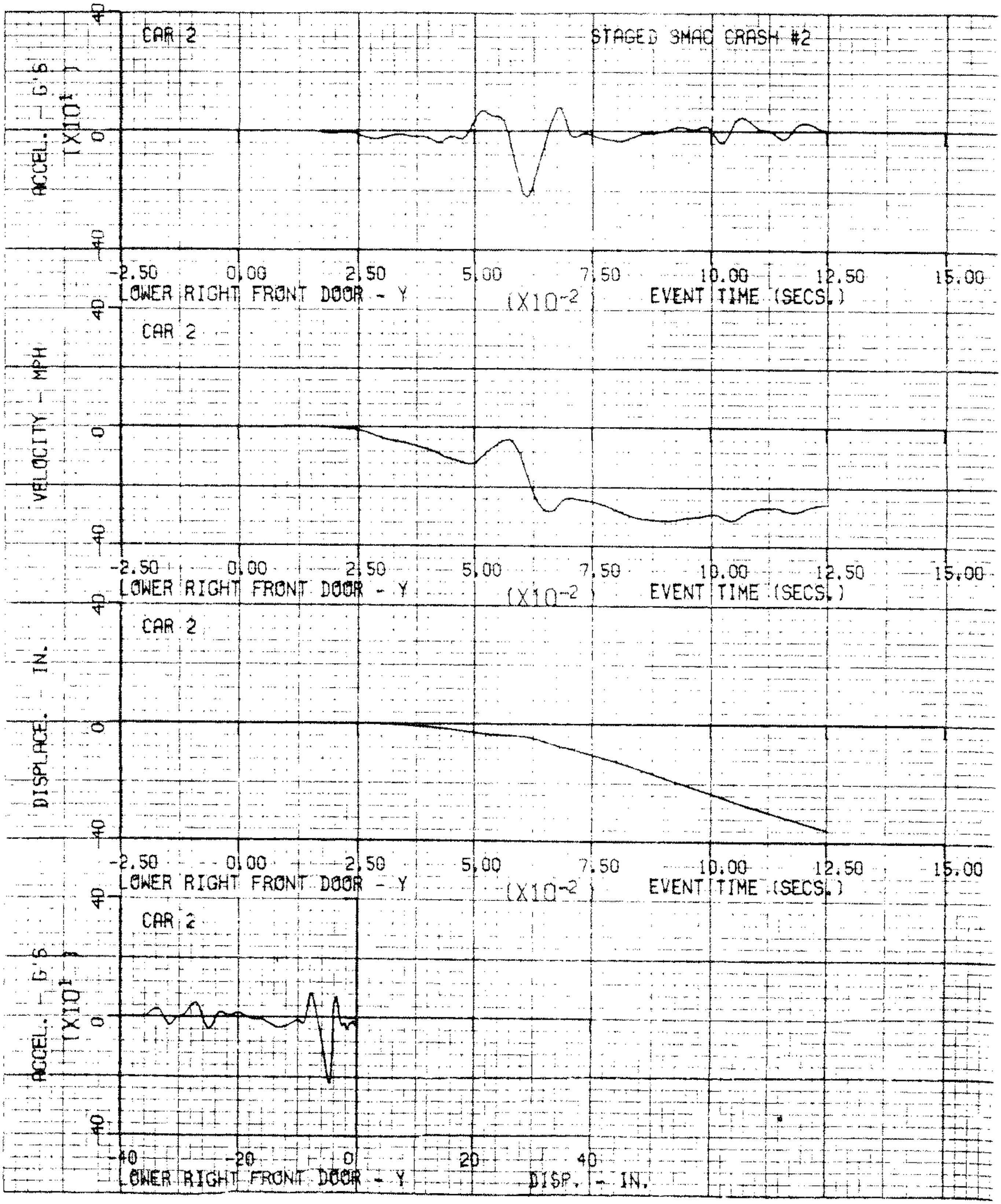

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
REAR DECK - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
REAR DECK - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-10
-20
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
REAR DECK - Y COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
40
-12 -8 -4 0 4
REAR DECK - Y COMP.
DISP. - IN.

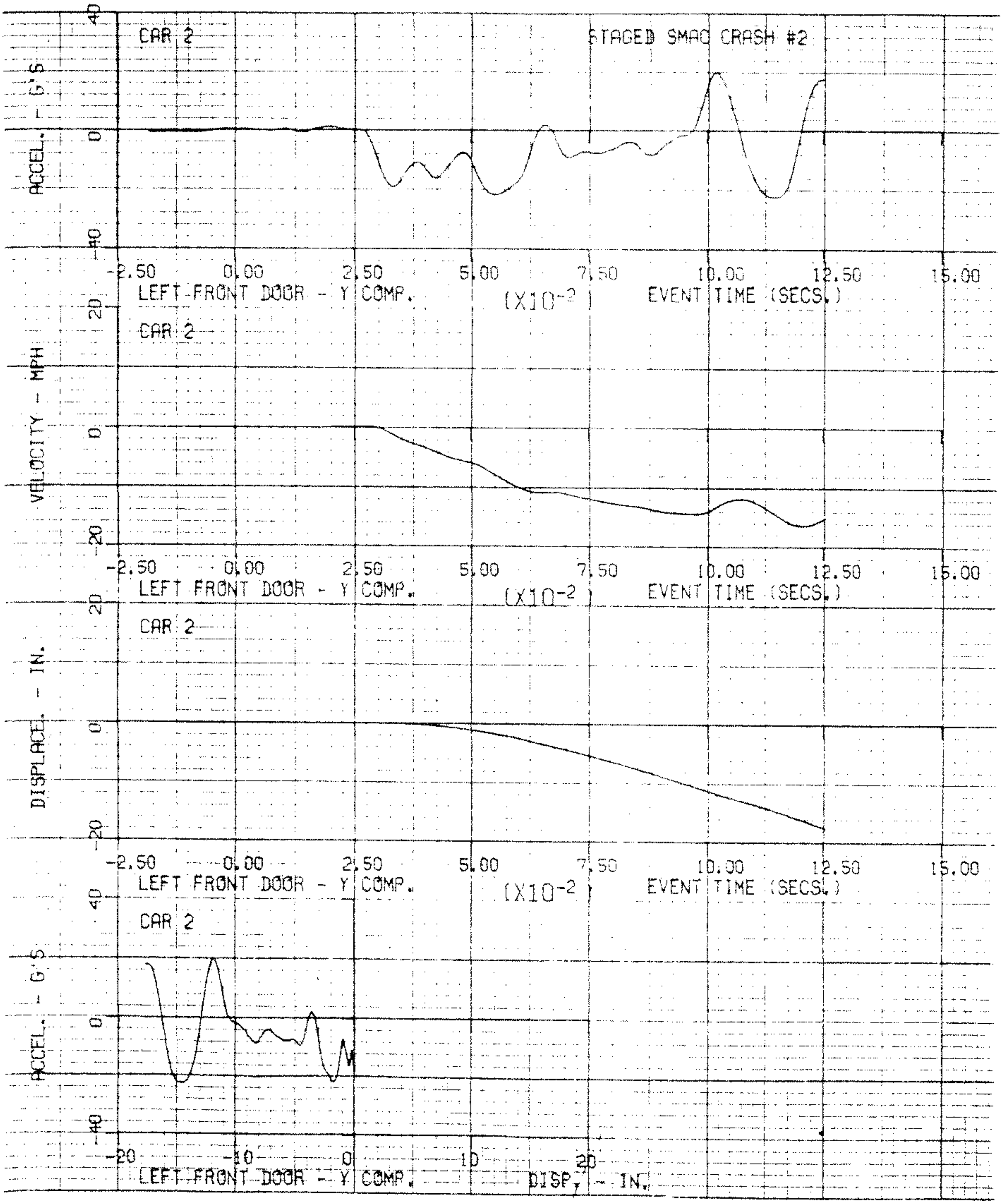
EQ-6057-V-4


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
5
0
-5
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
2
0
-2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-2
-1
0
1
2
REAR DECK - Z COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
20
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
REAR DECK - RESULTANT
(X10-2)
EVENT TIME (SECS.)


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S [X10¹]
20
0
-20
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
UPPER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
UPPER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
UPPER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S [X10¹]
20
0
-20
-30 -20 -10 0 10
UPPER RIGHT FRONT DOOR - Y
DISP. - Y IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S (X10¹)
40
0
40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
LOWER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
LOWER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
LOWER RIGHT FRONT DOOR - Y
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
40
0
40
-40 -20 0 20 40
LOWER RIGHT FRONT DOOR - Y
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT DOOR - Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT DOOR - Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
LEFT FRONT DOOR - Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-20
-10
0
10
20
LEFT FRONT DOOR - Y COMP.
DISP. - IN.

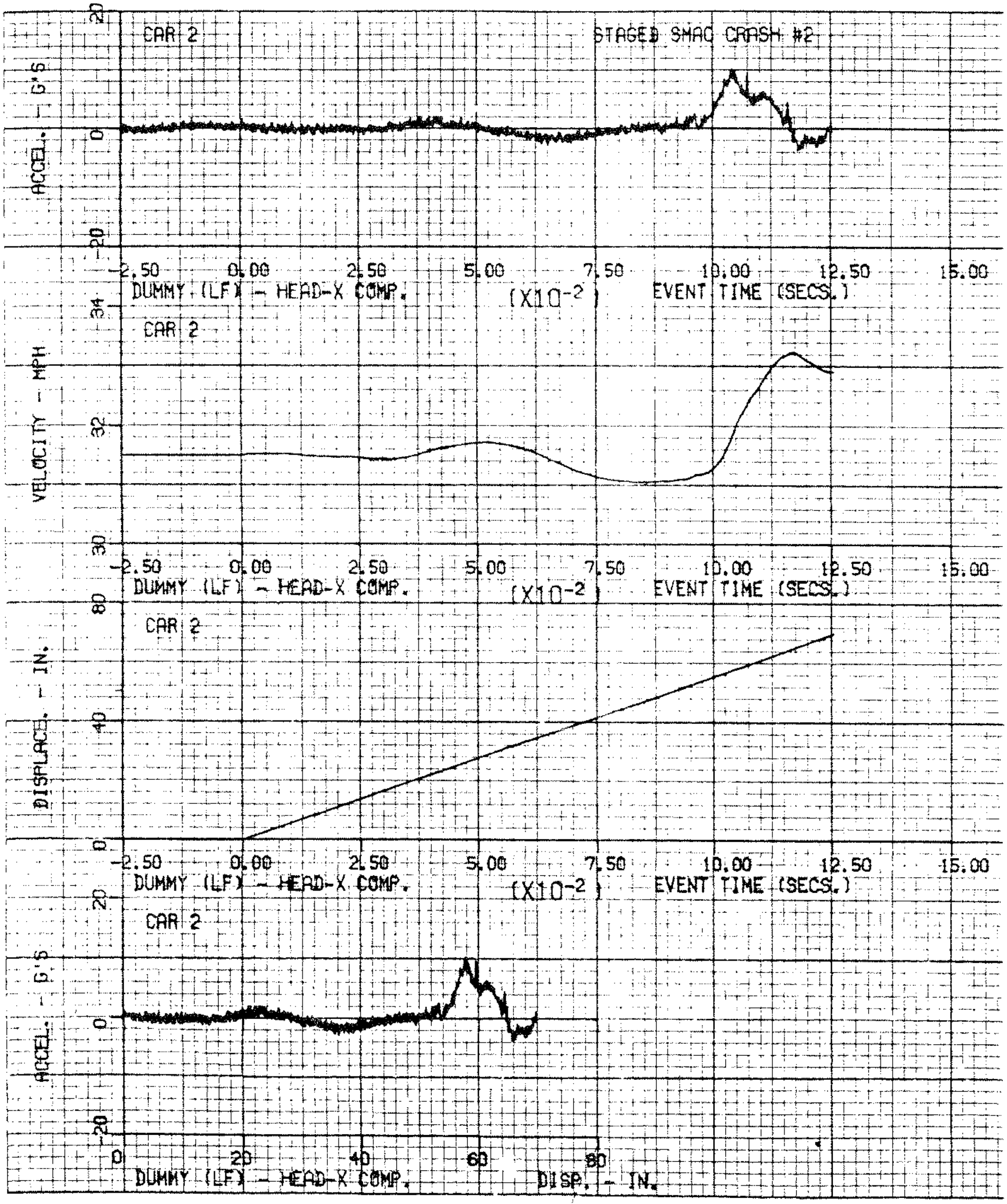
RICSAC TEST NO. 2

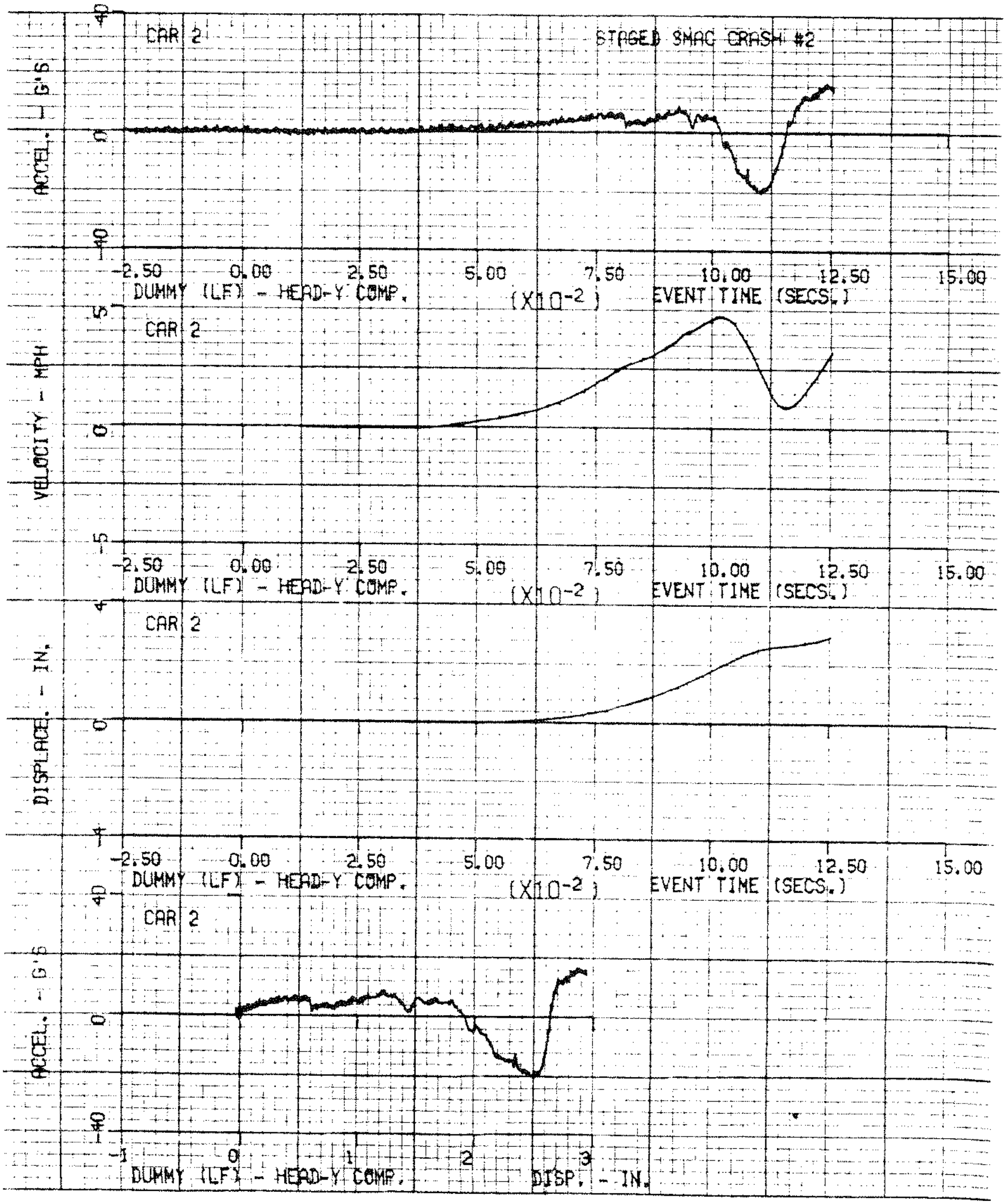
DUMMY DATA

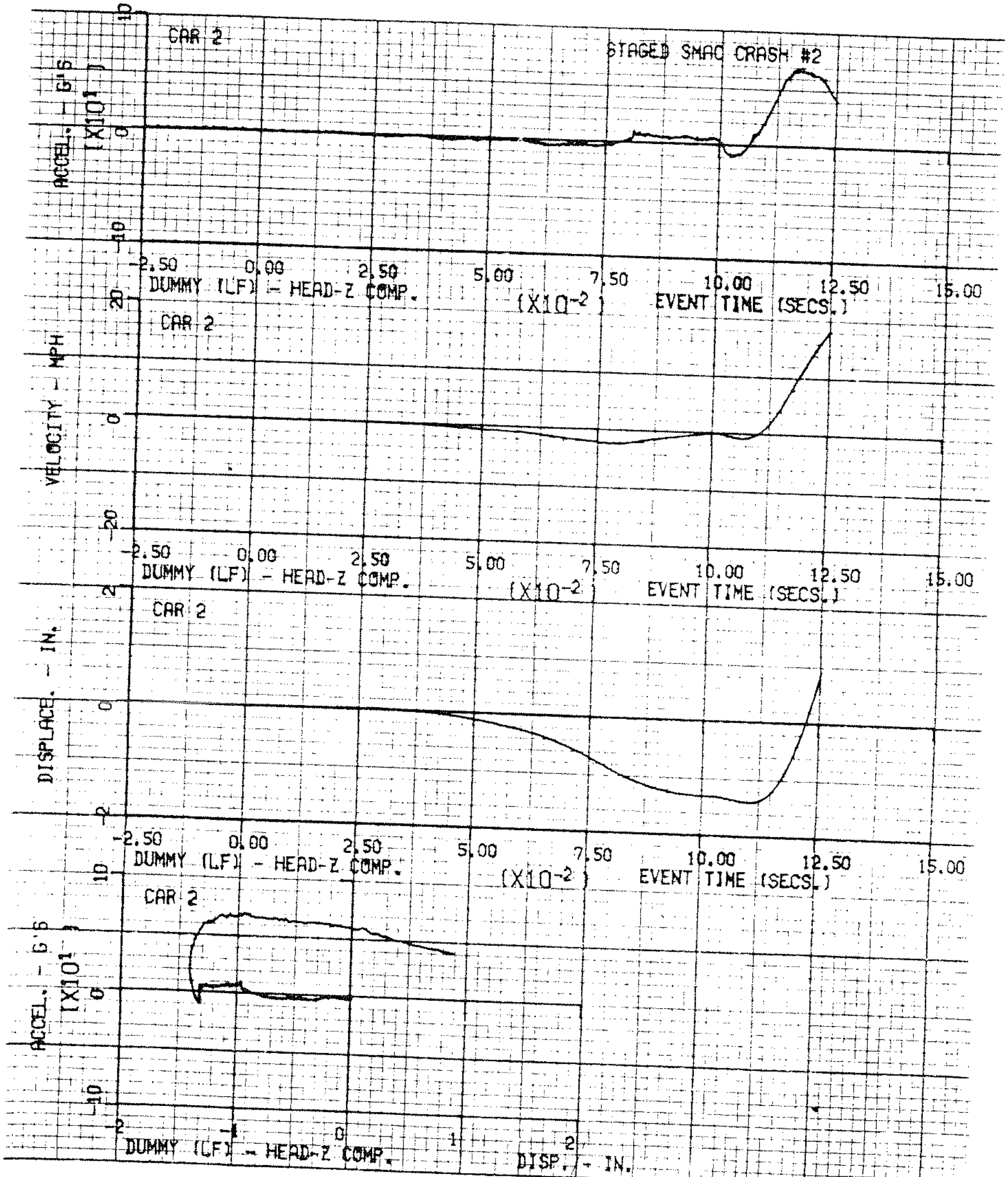
CAR NO. 2 PINTO

DATA PLOTS		FILTER CLASS
HEAD ACCELERATION	X,Y,X	1000
HEAD RESULTANT		
HEAD SEVERITY INDEX		
CHEST ACCELERATION	X,Y,Z	180
CHEST RESULTANT		
CHEST VELOCITY	X,Y,Z	
CHEST DISPLACEMENT	X,Y,Z	
CHEST SEVERITY INDEX		
PELVIC ACCELERATION	X	180
PELVIC VELOCITY	X	
PELVIC DISPLACEMENT	X	
FEMUR LOADS	L & R	600

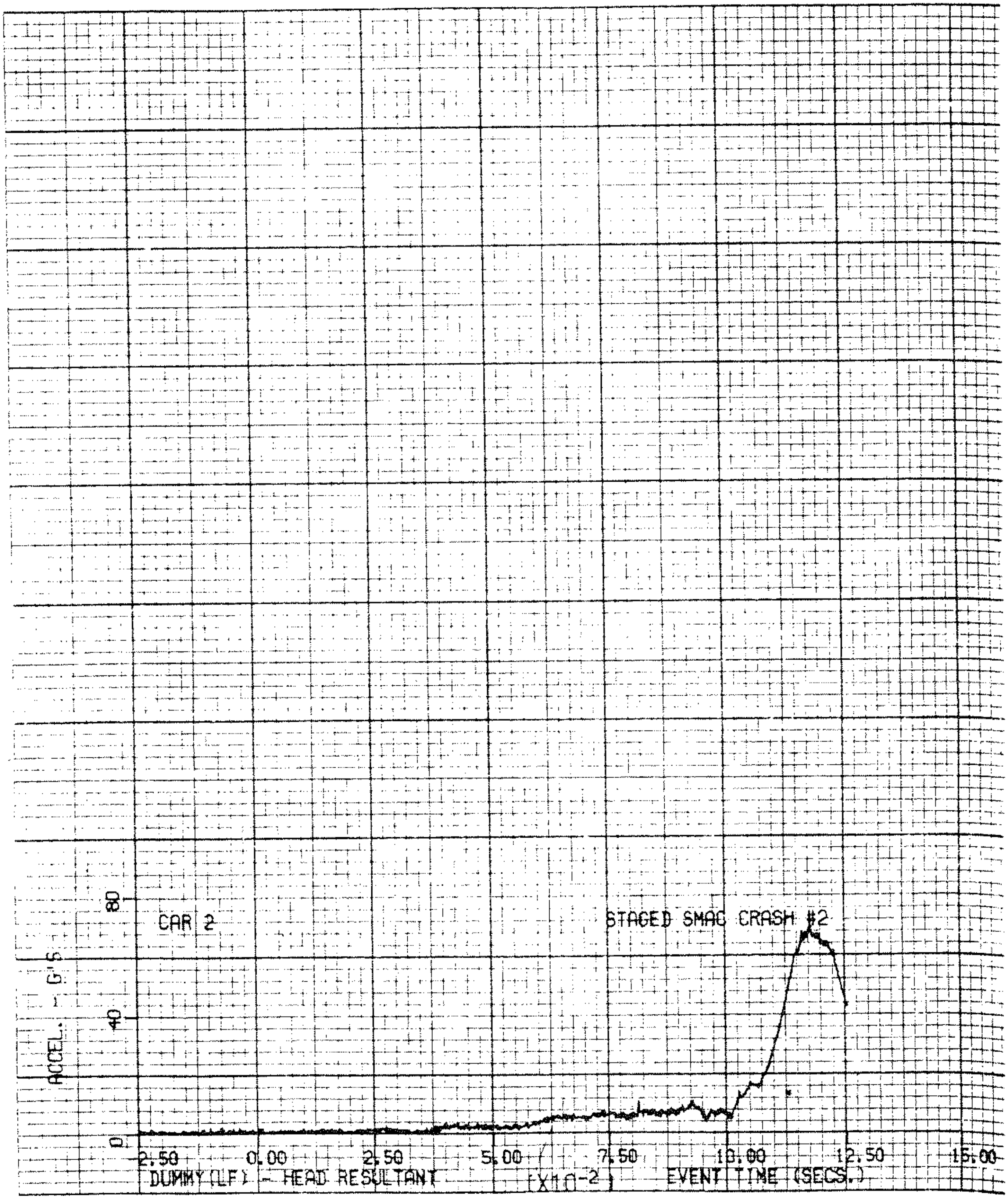
DATA PROCESSED TO ONLY 150 MILLISECONDS
DATA BEYOND THIS POINT WAS CONTAMINATED

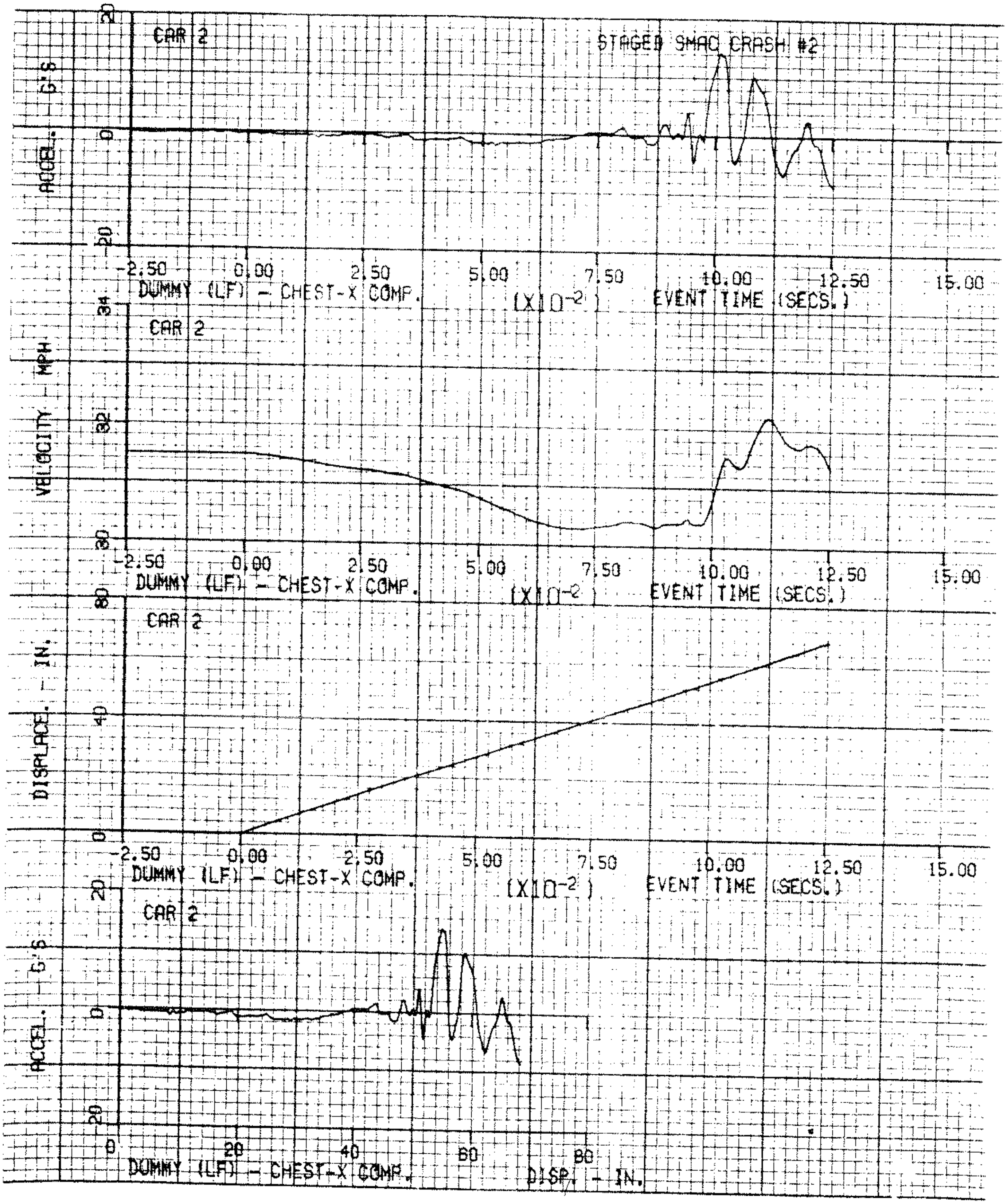

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
34
32
30
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-X COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
DUMMY (LF) - HEAD-X COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-Y COMP.
(X10-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
5
0
-5
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-Y COMP.
(X10-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
4
0
-4
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD-Y COMP.
(X10-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-1
0
1
2
3
DUMMY (LF) - HEAD-Y COMP.
DISP. - IN.

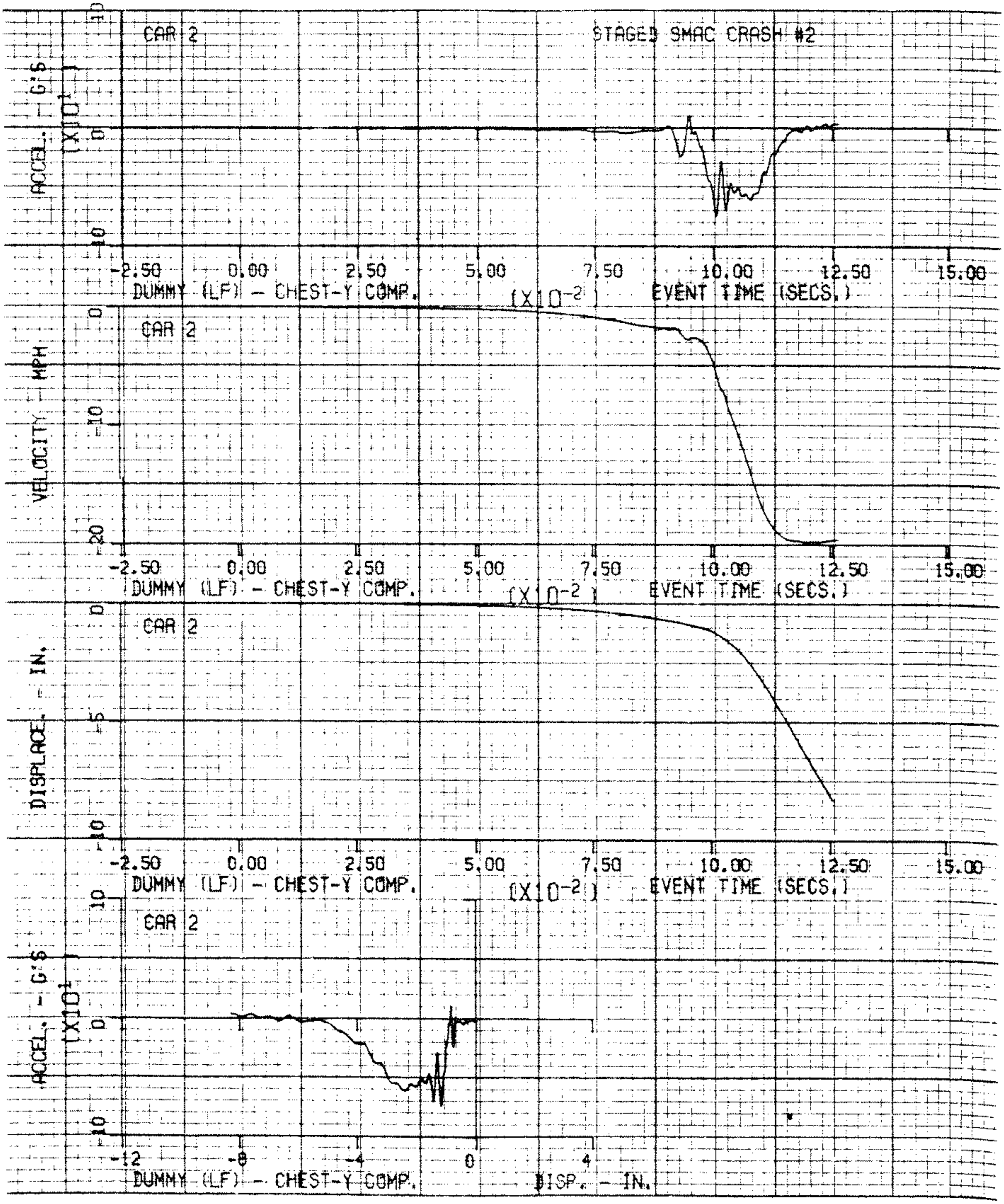

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
[X10^1]
DUMMY (LF) - HEAD-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.

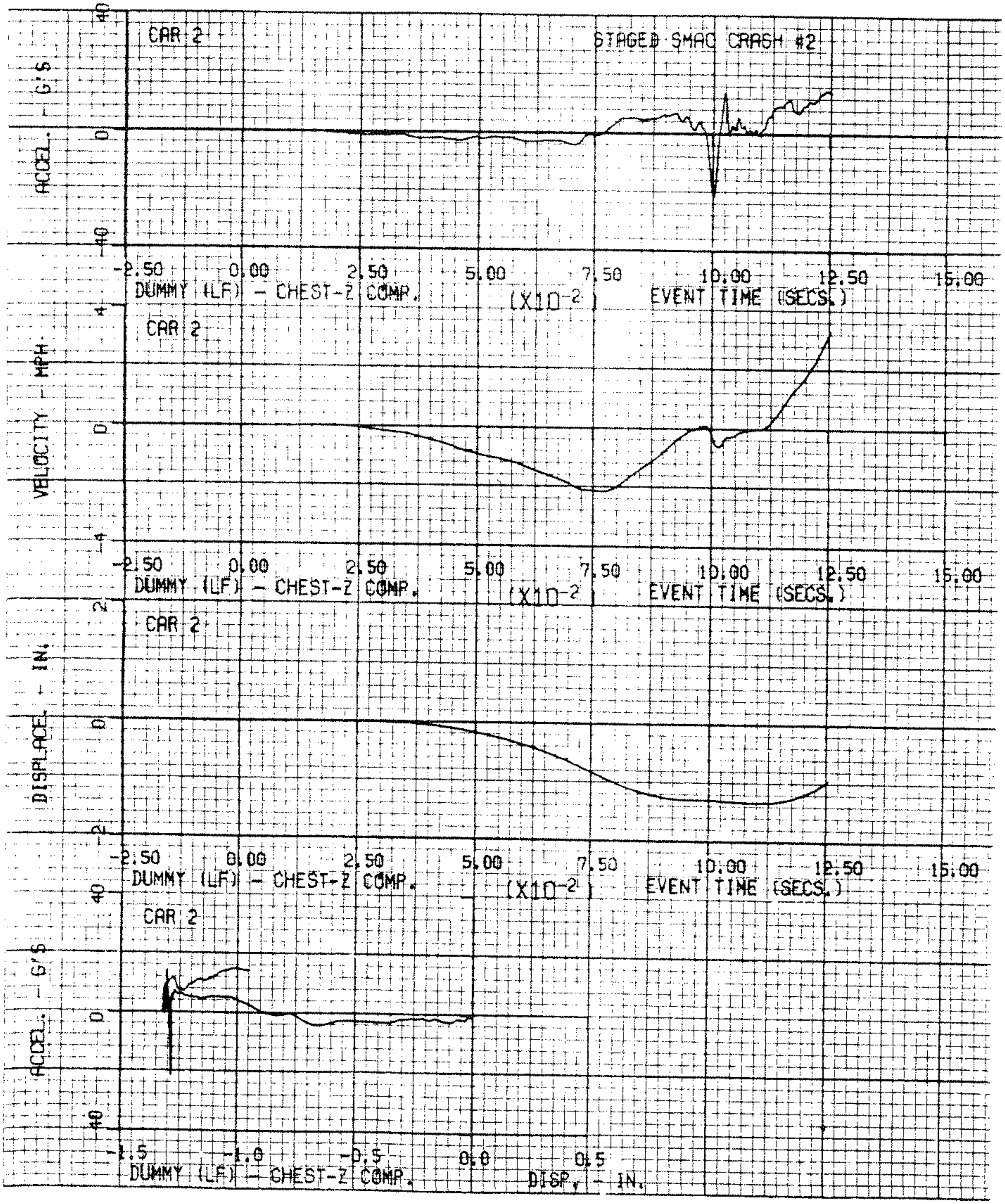
DQ-6057-V-4

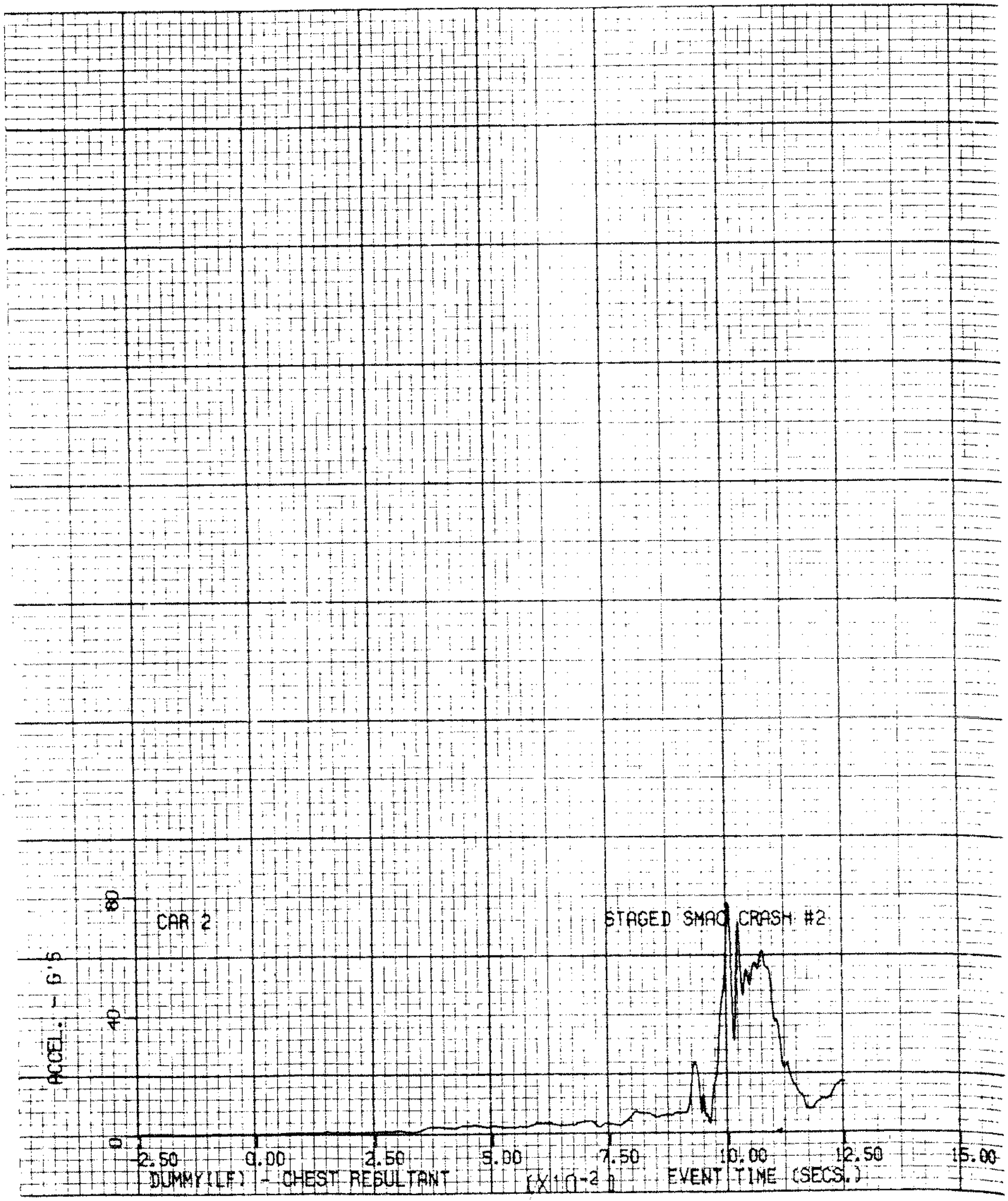

80
40
0
ACCEL. - G'S
CAR 2
STAGED SMAC CRASH #2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - HEAD RESULTANT
(X10^-2) EVENT TIME (SECS.)

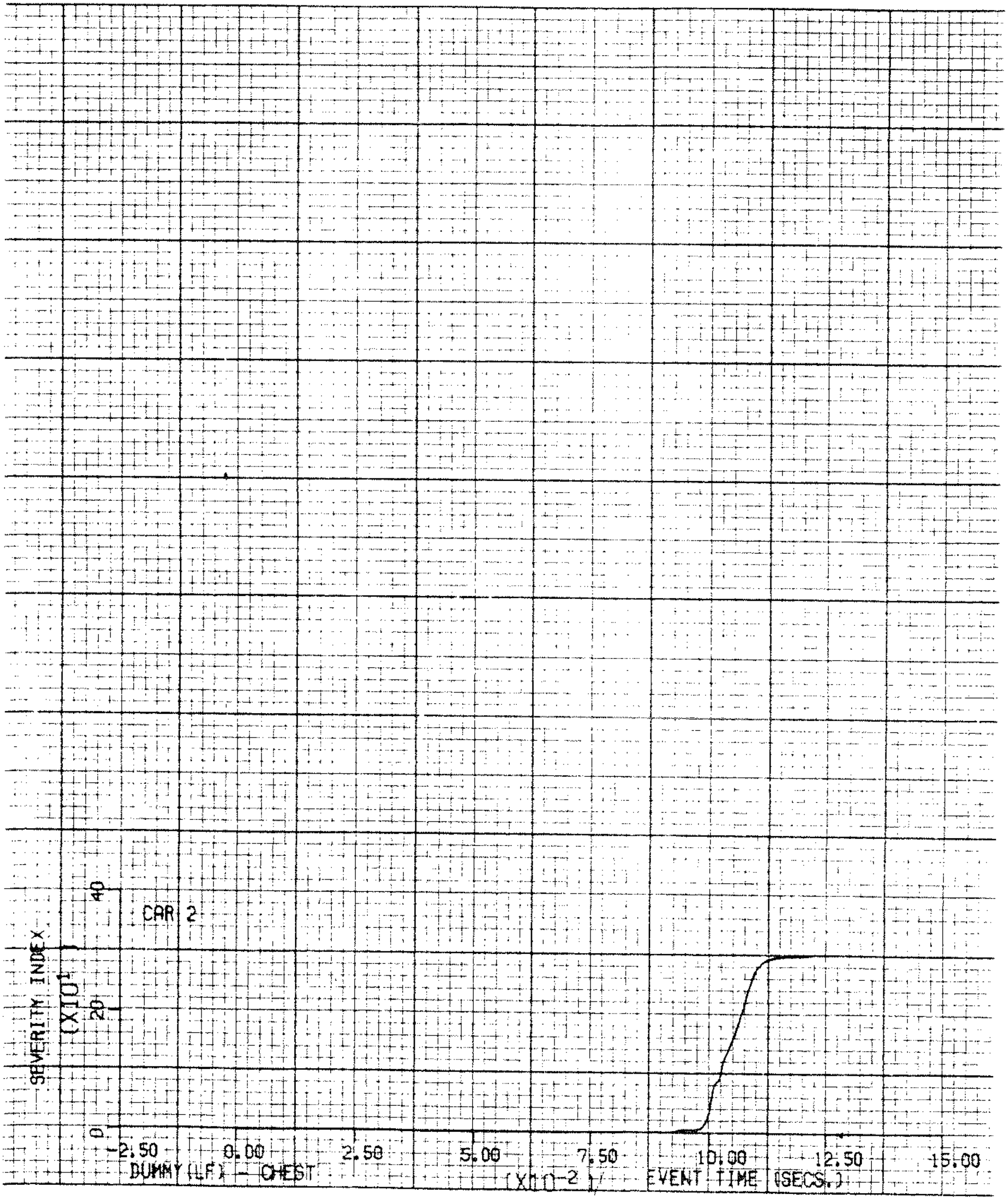

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
20
0
20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - CHEST-X COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
34
32
30
CAR 2
DISPLACE. - IN.
80
40
0
CAR 2
ACCEL. - G'S
DISP. - IN.
0
20
40
60
80

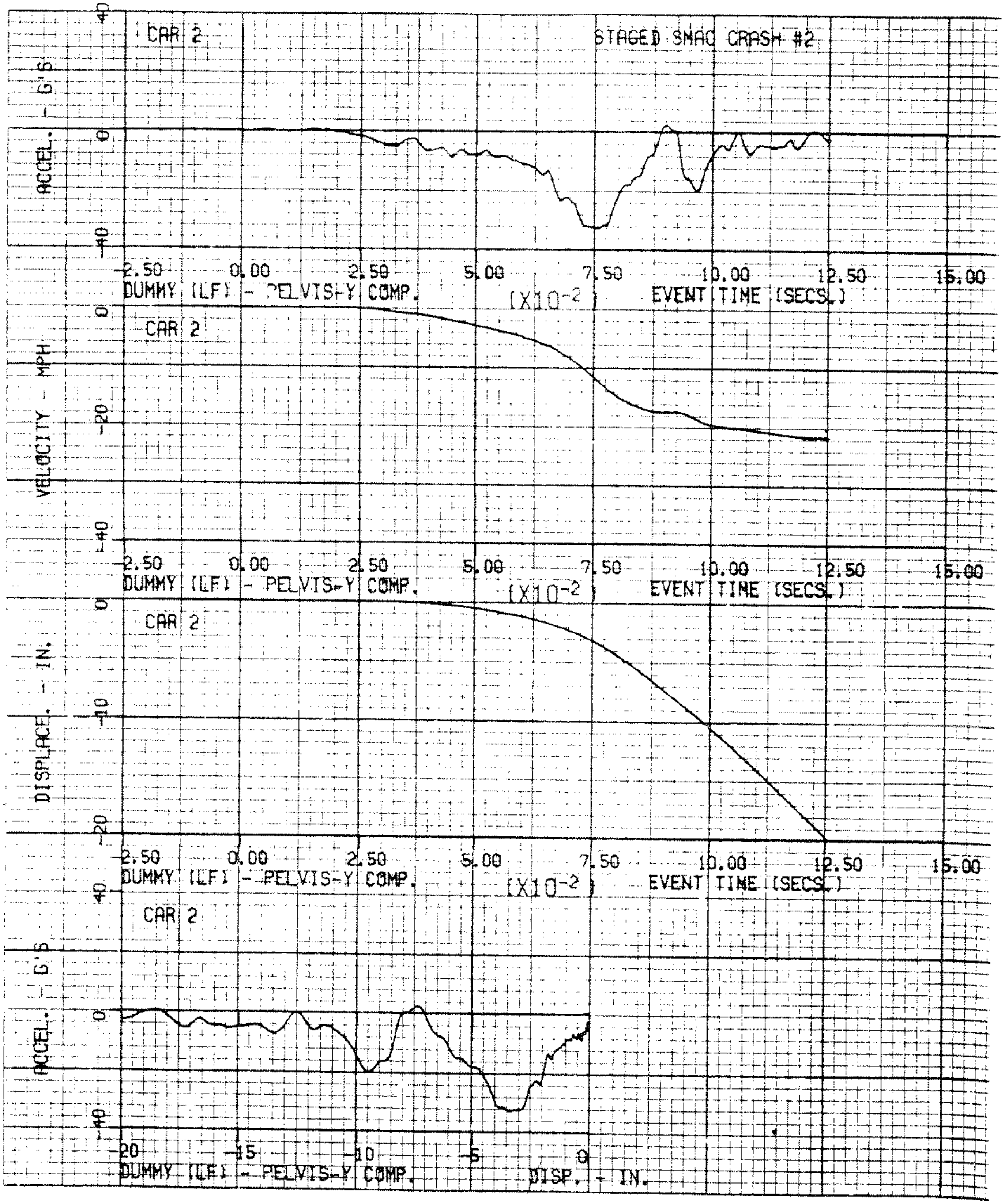
ZQ-6057-V-4

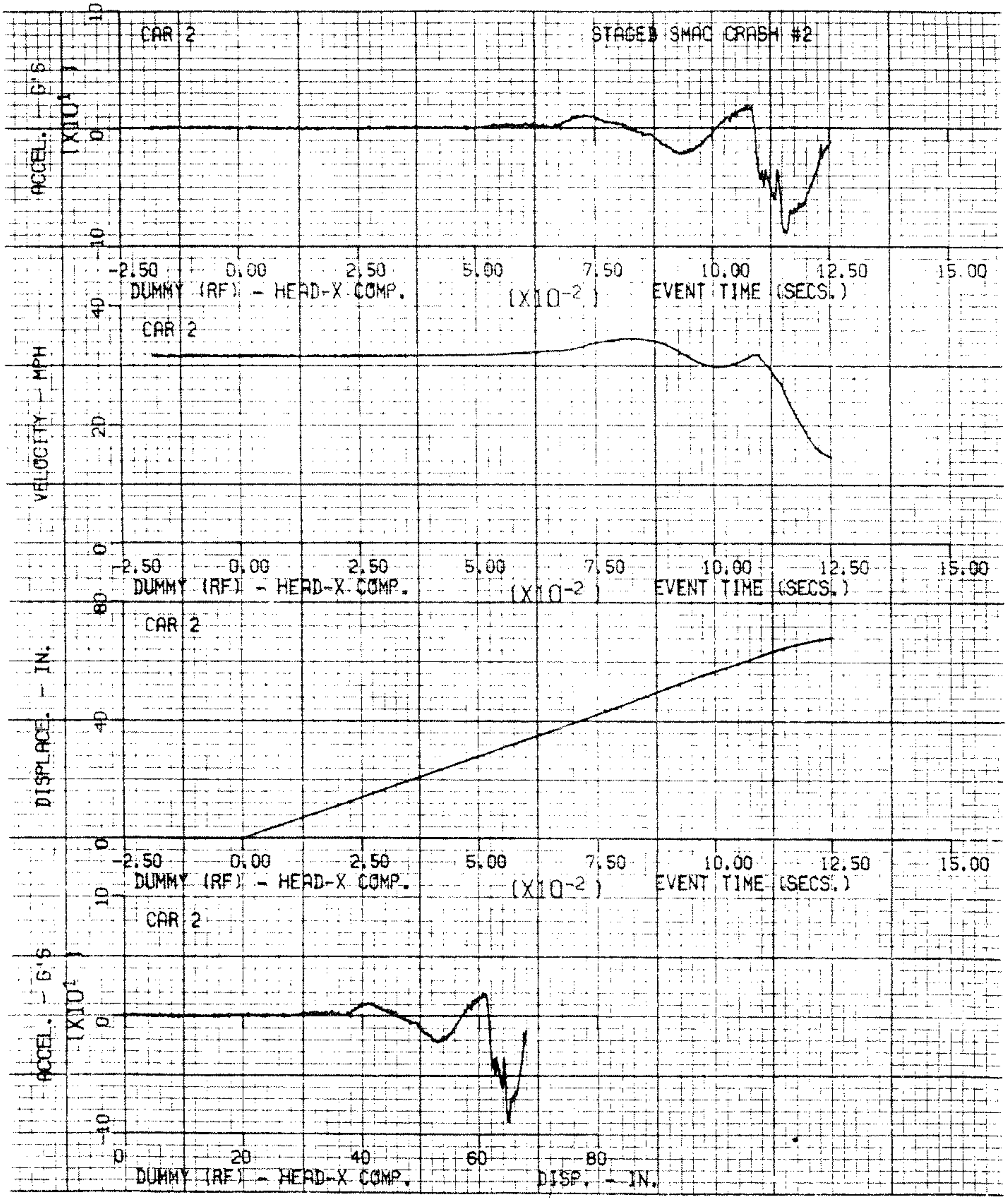

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S (X10¹)
DUMMY (LF) - CHEST-Y COMP. (X10⁻²) EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DUMMY (LF) - CHEST-Y COMP. DISP. - IN.

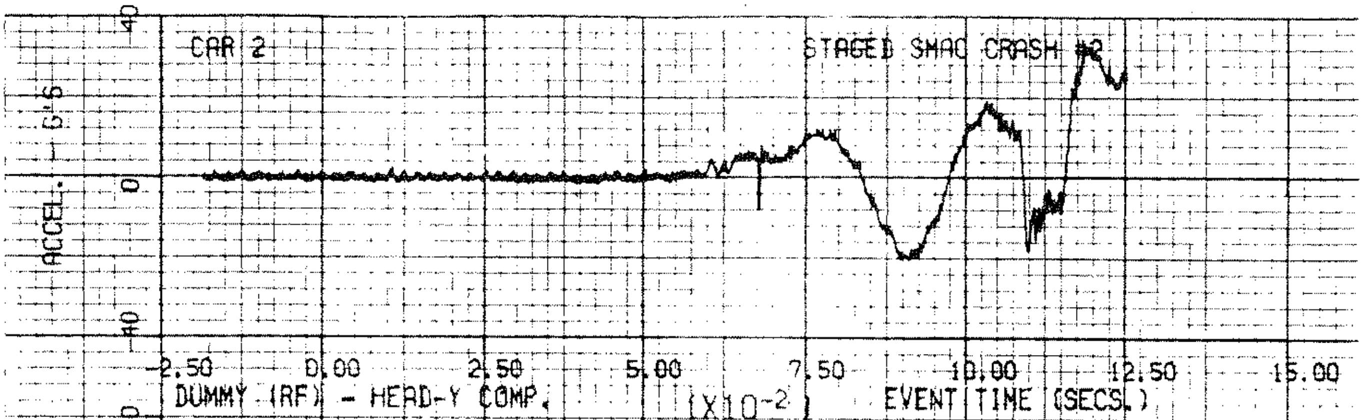

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - CHEST-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH.
4
0
-4
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - CHEST-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
2
0
-2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) - CHEST-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-1.5
-1.0
-0.5
0.0
0.5
DUMMY (LF) - CHEST-Z COMP.
DISP. - IN.

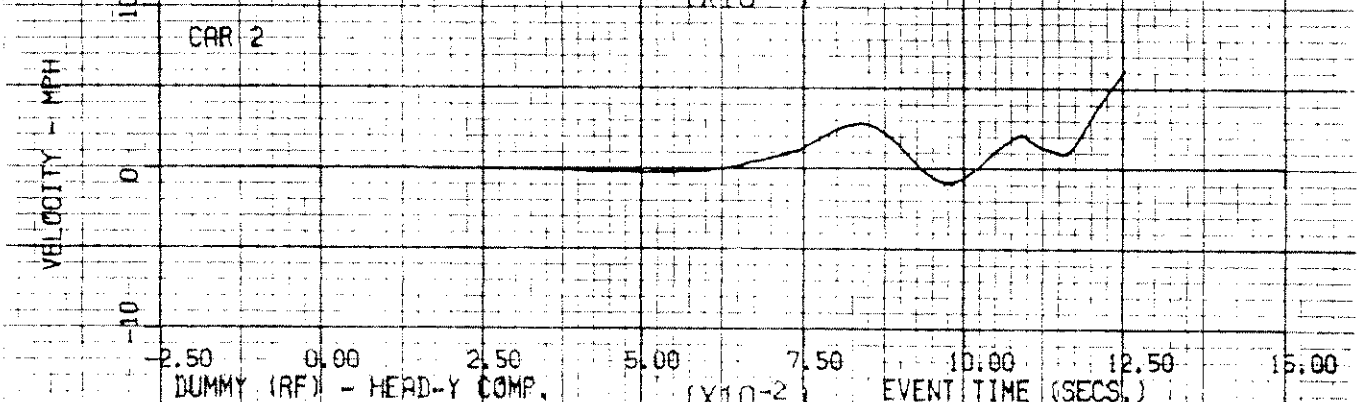

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
80
40
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY(LF) - CHEST RESULTANT
(X10-2)
EVENT TIME (SECS.)

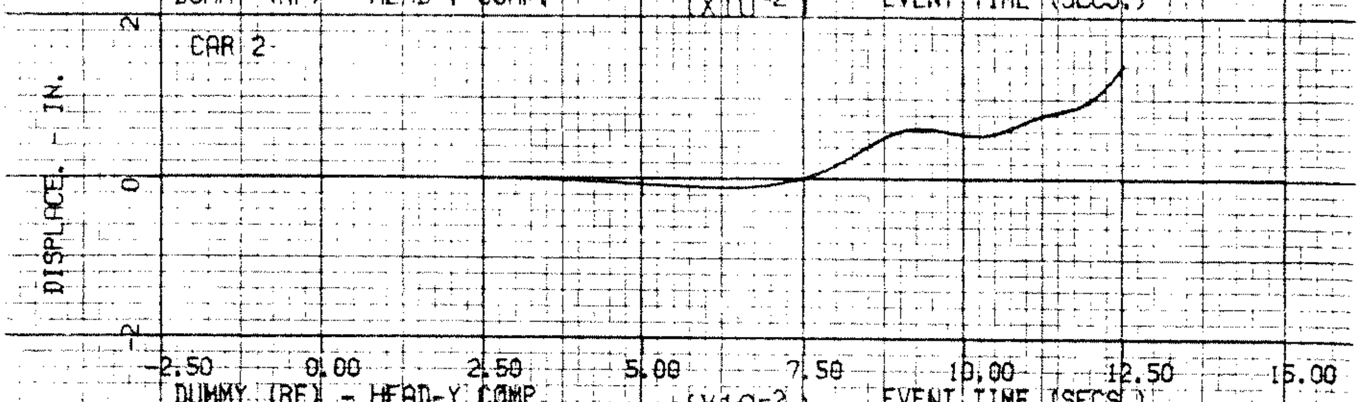

SEVERITY INDEX
(X10¹)
40
20
0
CAR 2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY(LF) - CHEST
(X10-2)
EVENT TIME (SECS.)

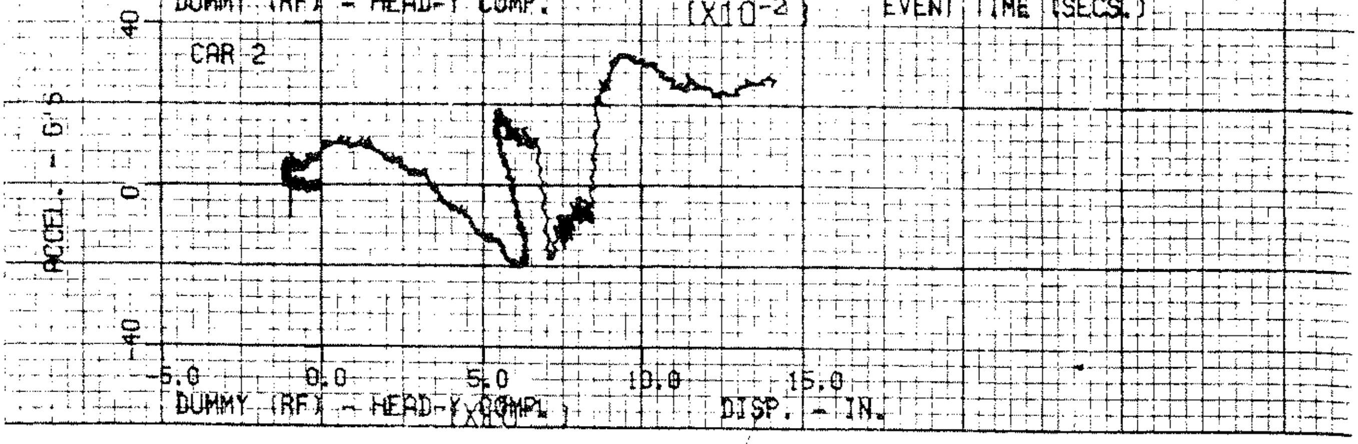

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
40
0
-40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
DUMMY (LF) - PELVIS-Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
0
-20
-40
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
DUMMY (LF) - PELVIS-Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0
-10
-20
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
DUMMY (LF) - PELVIS-Y COMP.
(X10^{-2})
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-20 -15 -10 -5 0
DUMMY (LF) - PELVIS-Y COMP.
DISP. - IN.

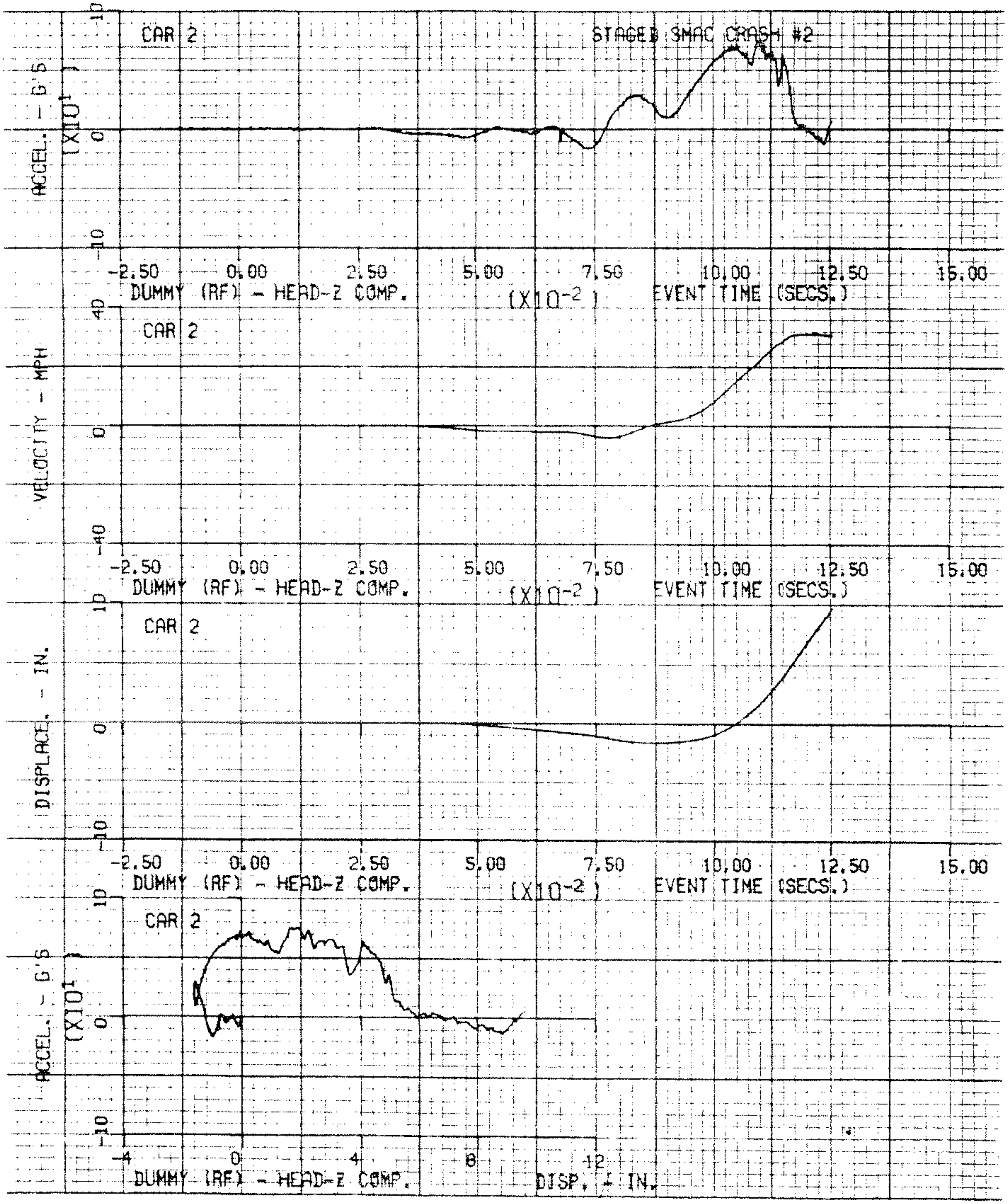

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S (X10¹)
-2.50 0.00 2.50 5.00 7.50 10.00 12.50 15.00
DUMMY (RF) - HEAD-X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
DUMMY (RF) - HEAD-X COMP.
CAR 2
DISPLACE. - IN.
DUMMY (RF) - HEAD-X COMP.
CAR 2
ACCEL. - G'S (X10¹)
0 20 40 60 80
DUMMY (RF) - HEAD-X COMP.
DISP. - IN.

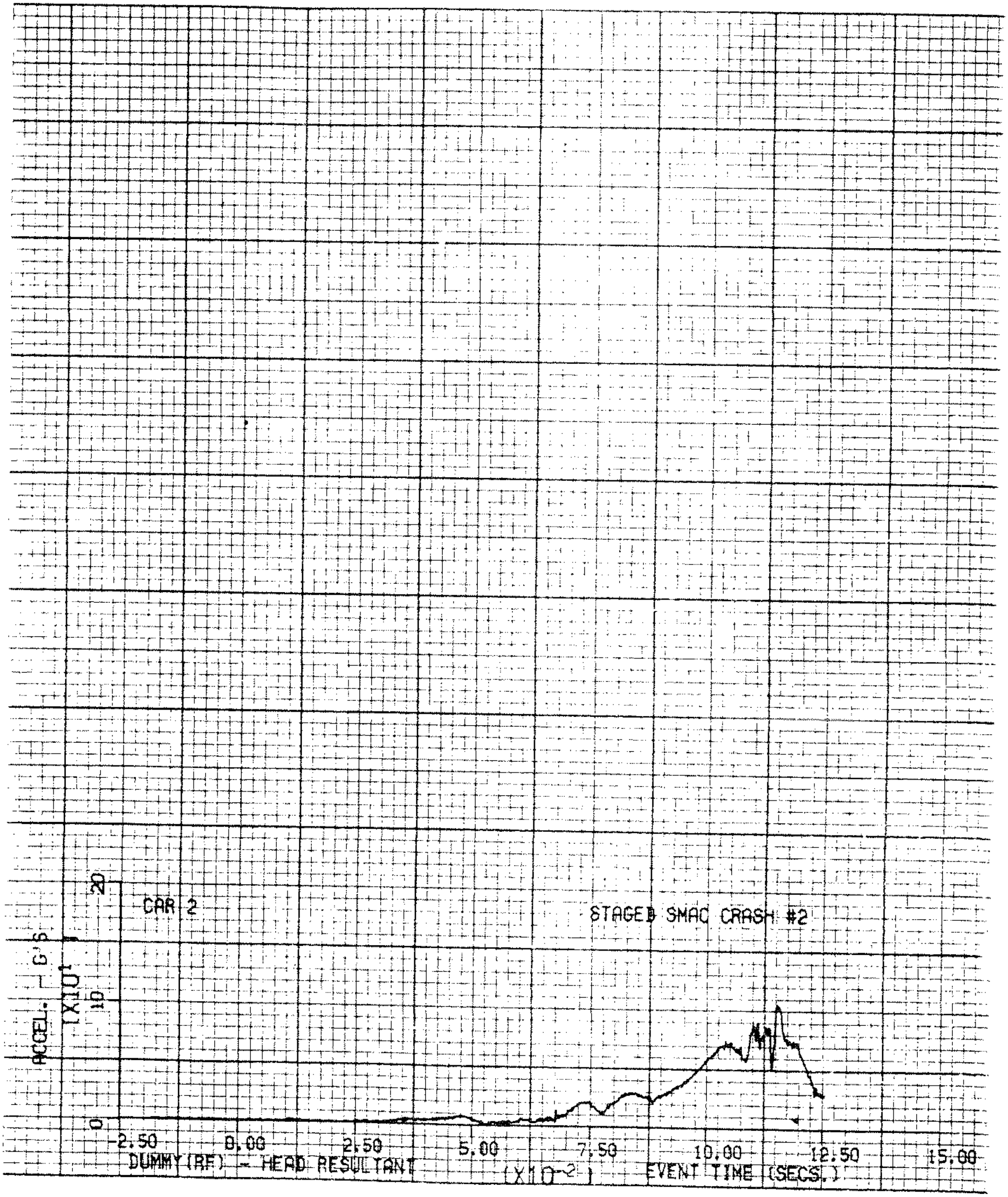

CAR 2
STAGED SHAG CRASH #2
ACCEL. - G'S
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Y COMP.
(X10^-2)
EVENT TIME (SECS.)


CAR 2
VELOCITY - MPH
10
0
-10
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Y COMP.
(X10^-2)
EVENT TIME (SECS.)


CAR 2
DISPLACE. - IN.
2
0
-2
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Y COMP.
(X10^-2)
EVENT TIME (SECS.)


CAR 2
ACCEL. - G'S
40
0
-40
-5.0
0.0
5.0
10.0
15.0
DUMMY (RF) - HEAD-Y COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
[X10^1]
10
0
-10
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
0
-10
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - HEAD-Z COMP.
(X10^-2)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
[X10^1]
10
0
-10
-4
0
4
8
12
DUMMY (RF) - HEAD-Z COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
(X10¹)
20
10
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY(RF) - HEAD RESULTANT
(X10⁻²)
EVENT TIME (SECS.)

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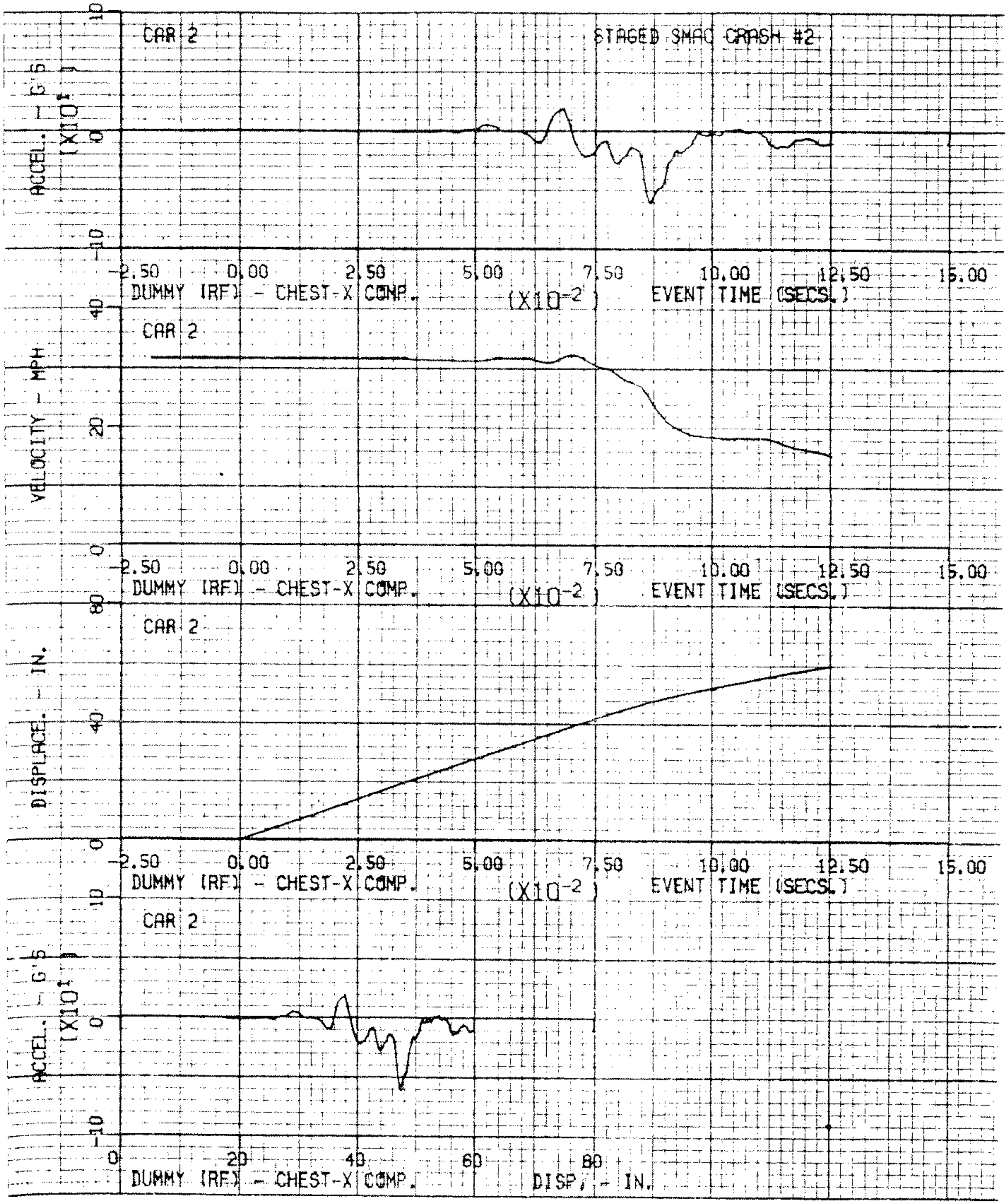
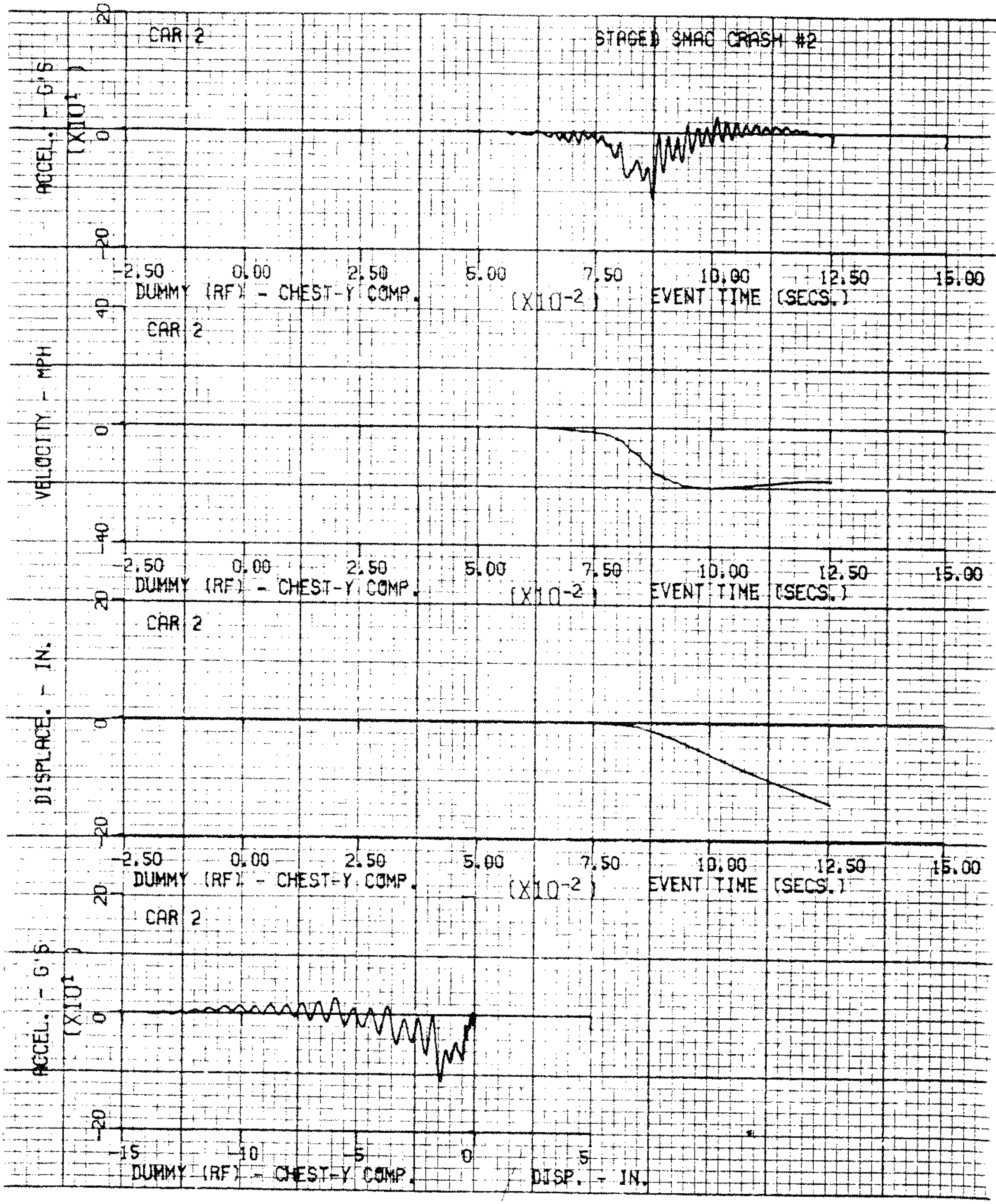
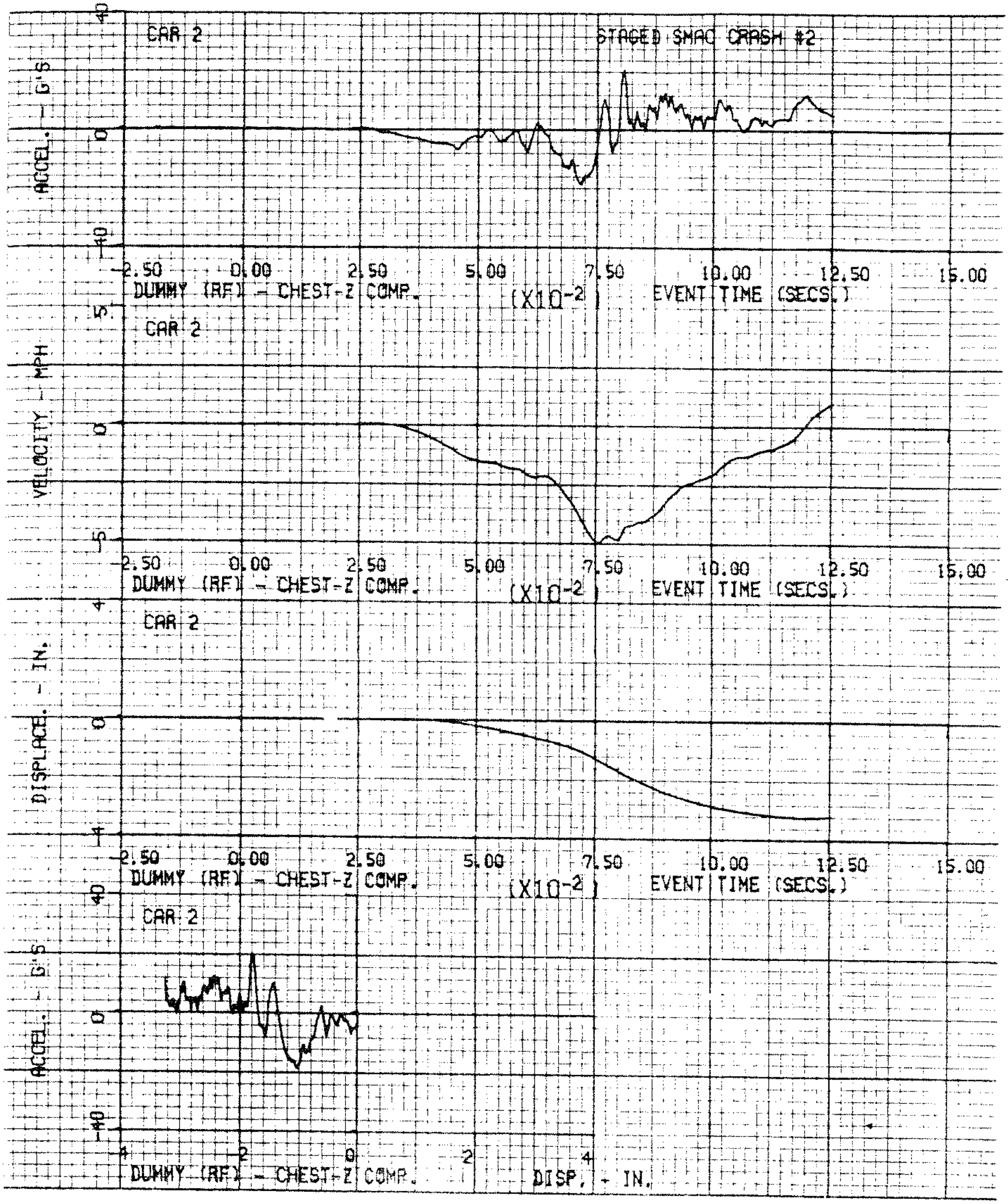
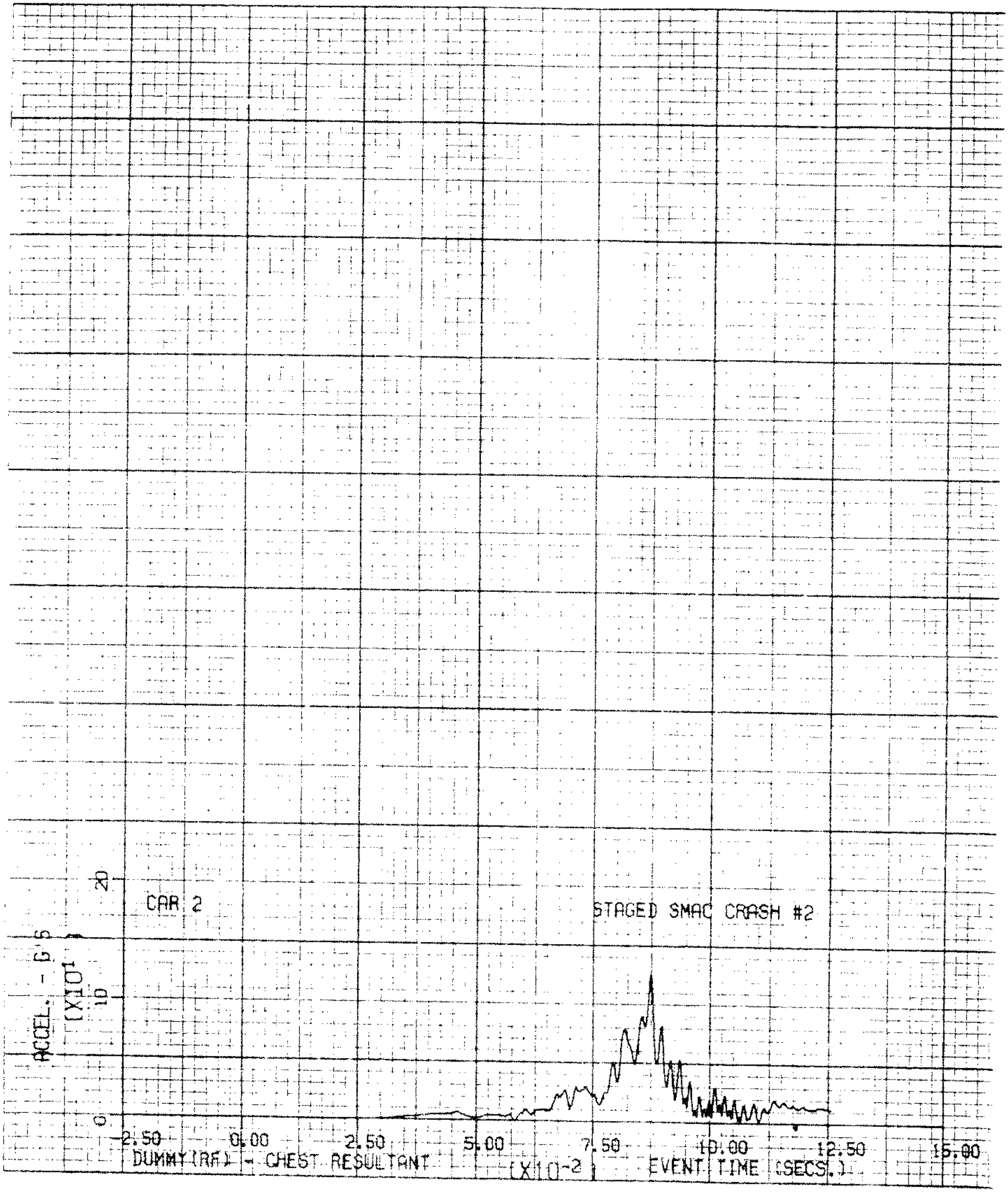

CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S (X10¹)
10
0
-10
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - CHEST-X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
DUMMY (RF) - CHEST-X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
DUMMY (RF) - CHEST-X COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
10
0
-10
0
20
40
60
80
DUMMY (RF) - CHEST-X COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S (X10¹)
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - CHEST-Y COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - CHEST-Y COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) - CHEST-Y COMP.
(X10⁻²)
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
20
0
-20
-15
-10
-5
0
5
DUMMY (RF) - CHEST-Y COMP.
DISP. - IN.


CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
DUMMY (RF) - CHEST-Z COMP.
(X10-2)
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.



CAR 2
STAGED SMAC CRASH #2
ACCEL. - G'S
[X10^{1}]
20
10
0
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY(RF) - CHEST RESULTANT
[X10^{-2}]
EVENT TIME (SECS.)

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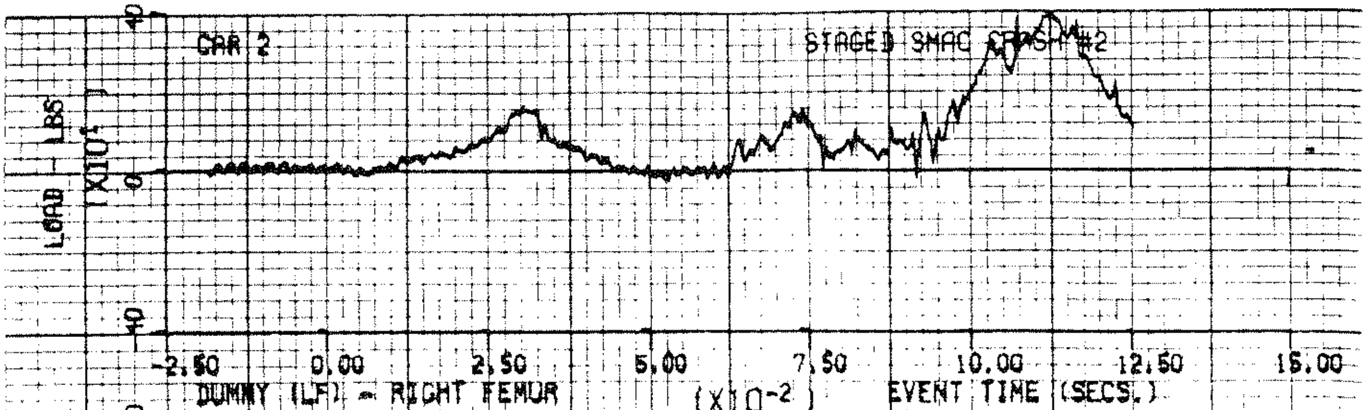
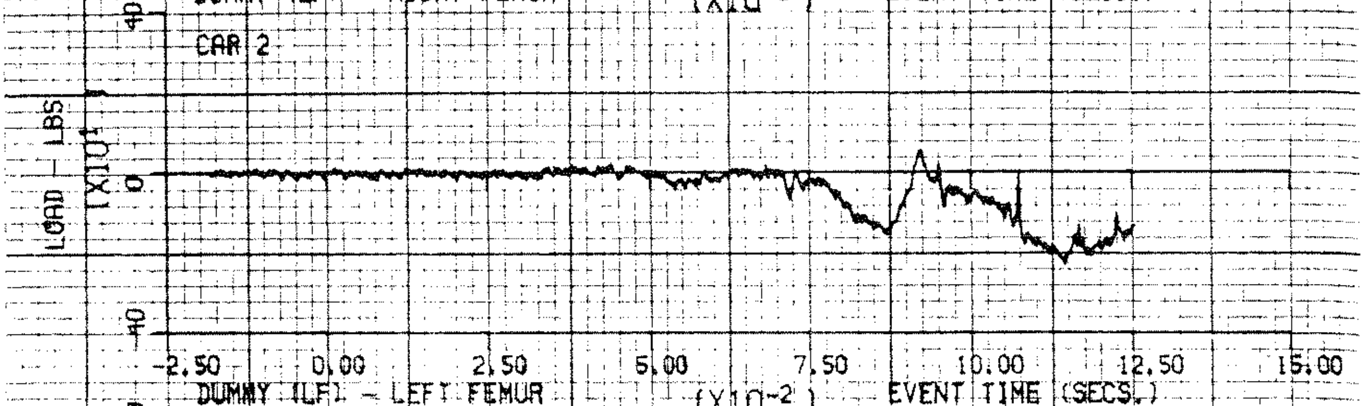
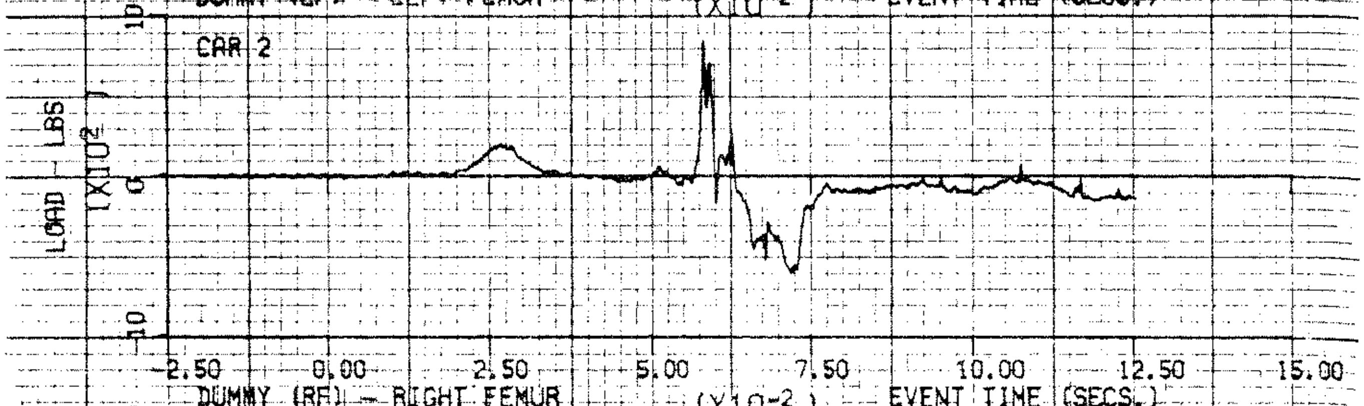
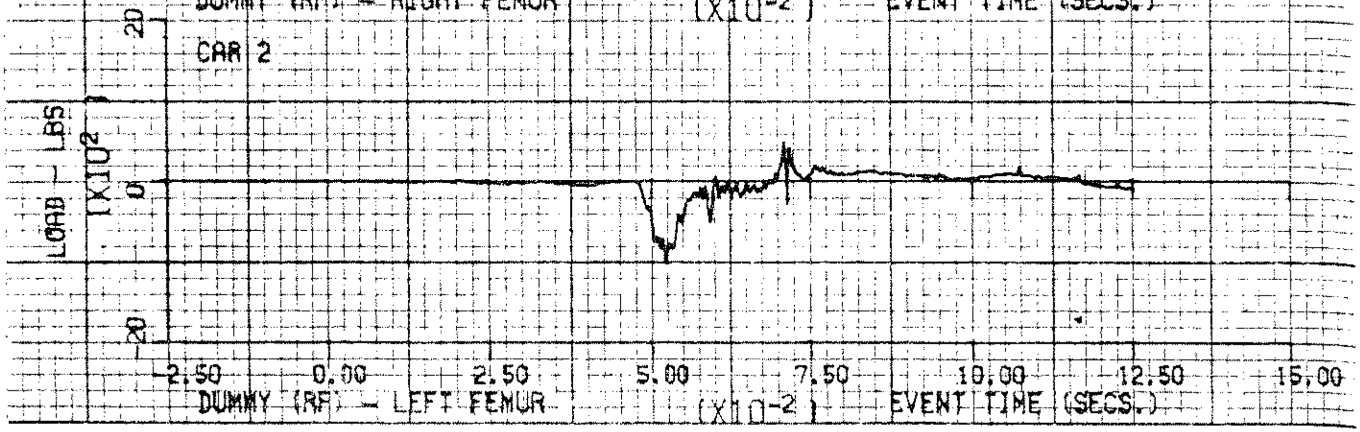

CAR 2
STAGED SMAC CRASH #2
LOAD — LBS
$(X10^{1})$
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) — RIGHT FEMUR
$(X10^{-2})$
EVENT TIME (SECS.)


CAR 2
LOAD — LBS
$(X10^{1})$
40
0
-40
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (LF) — LEFT FEMUR
$(X10^{-2})$
EVENT TIME (SECS.)


CAR 2
LOAD — LBS
$(X10^{2})$
10
0
-10
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) — RIGHT FEMUR
$(X10^{-2})$
EVENT TIME (SECS.)


CAR 2
LOAD — LBS
$(X10^{2})$
20
0
-20
-2.50
0.00
2.50
5.00
7.50
10.00
12.50
15.00
DUMMY (RF) — LEFT FEMUR
$(X10^{-2})$
EVENT TIME (SECS.)

TEST NO. 3

RICSAC STAGED COLLISION

FRONT-TO-REAR

OBLIQUE - OFFSET

TORINO/PINTO

VELOCITY 21.2 MPH

ACCIDENT SCHEMATIC

VEHICLES:

No. 1 - 1974 FORD TORINO
No. 2 - 1974 FORD PINTO

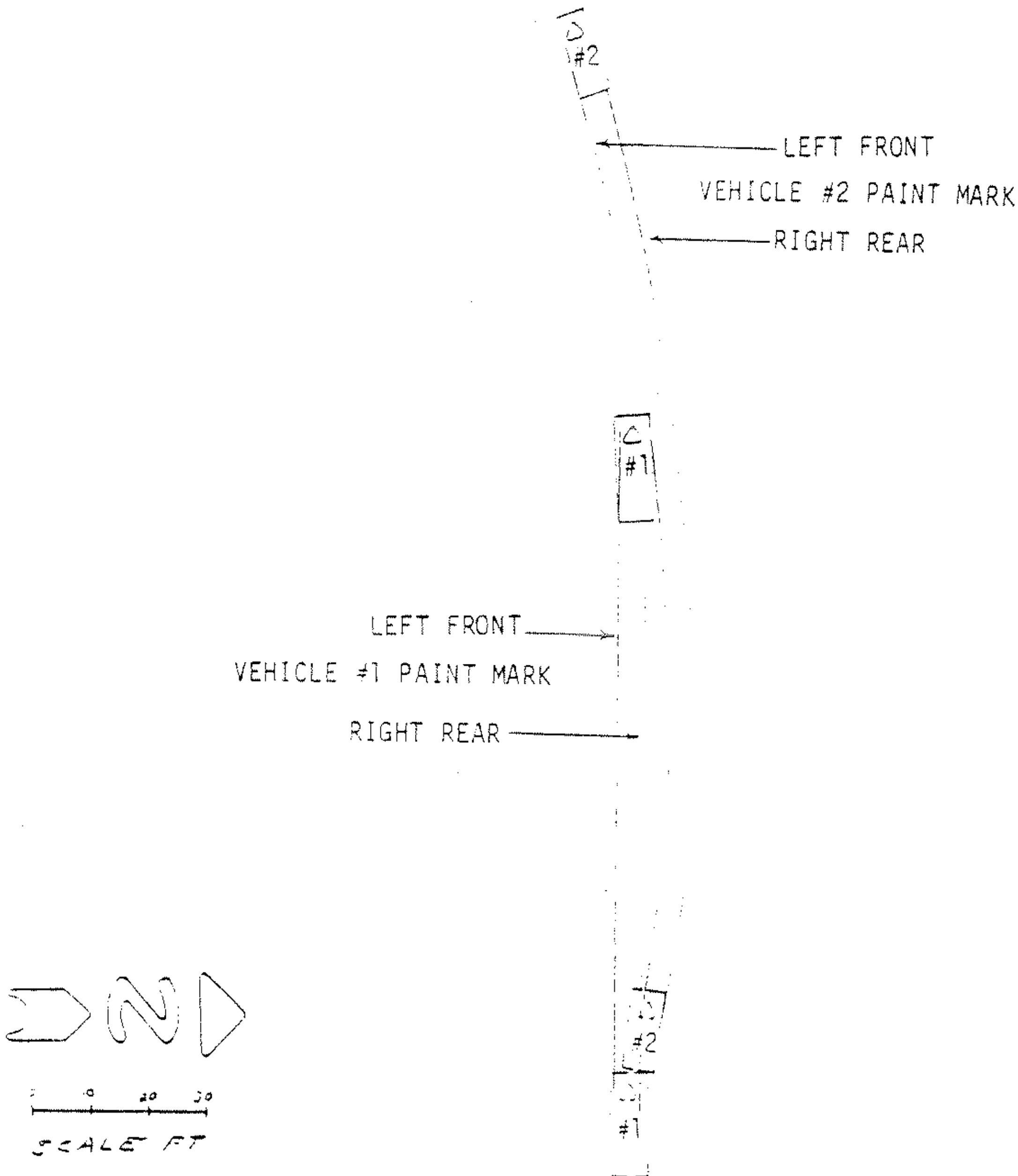


Figure 9-4 TEST NO. 3 - RICSAC ACCIDENT SCHEMATIC

CRASH TEST SUMMARY

TEST NO. 3

PROJECT Staged Car-to-Car Collision

DATE 4/18/78

TIME 13:45

TEMP. 51°F

TEST CONDITION Rear Oblique Offset (26 inch Offset) at 10°

VEHICLE NO. 1 1974 Ford Torino

VEHICLE NO. 2 1974 Ford Pinto

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	4980	3140
IMPACT ANGLE (deg)*	0	0
IMPACT VELOCITY (mph)**	21.23	0
MAX. CRUSH (in)	2.2"	6.7"
MAX. INTRUSION (in)	None	None

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Part 572	Part 572
LOCATION	Driver (LF) Passenger (RF)	Driver (LF) Passenger (RF)
RESTRAINT	3-Point Restraint System (Uninstrumented)	(Instrumentation)

NUMBER OF DATA CHANNELS 64

NUMBER OF HIGH SPEED CAMERAS 9

*WITH RESPECT TO TOW TRACK CENTERLINE

**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

V

TEAM	YEAR	MONTH	DAY	SEQUENCE
__	8	04	18	___

TABLE 9-1

TEST NO. 3 - CAR NO. 1

VEHICLE DATA

Vehicle data not collected. Reason? ____

Vehicle No. 1

14-15 No. of VIN Characters 1 1

16-22 VIN (Left Justify, Omit Production Numbers) 4 H 2 7 Q 2 3

23-27 Make/Model (CPIR Code) Ford / Torino 4 dr. 1 2 1 0 1

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more 6 5 9 7 4.

33-34 Model Year 99999 = Unknown 7 4

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 4,0 0 0

40-42 Occupant and Cargo Only __ __, __ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 1	1 2 F Z E W 1	2	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ____	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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Figure 9-2

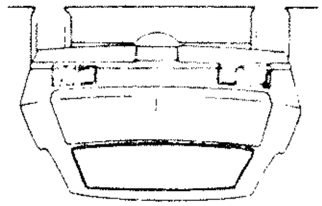
VEHICLE CRUSH SCHEMATIC
TEST NO. 3 - CAR NO. 1

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 2
LF 2
RR 2
LR 2

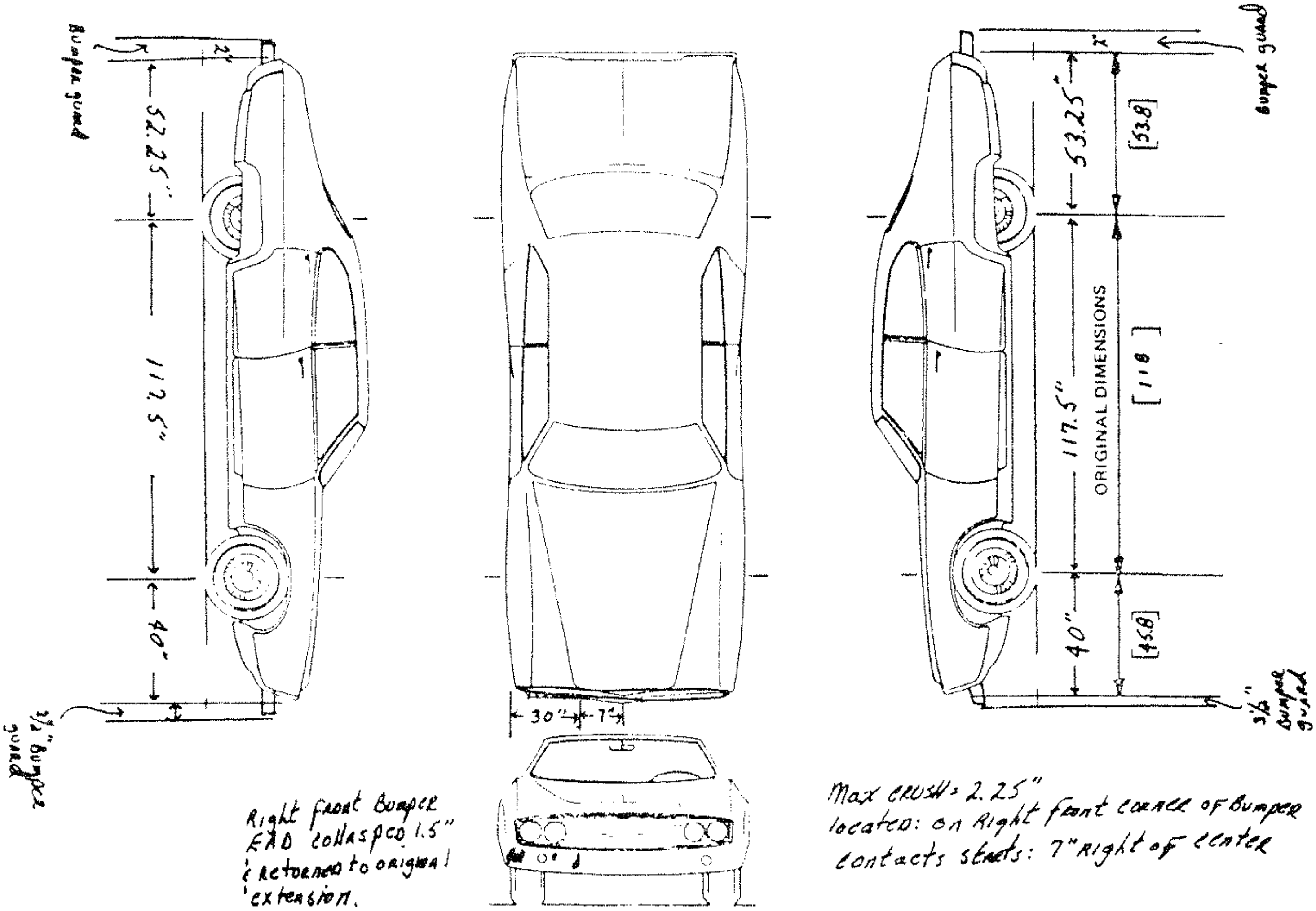
1 Yes, 2 No, 8 NA, 9 Unk.



WHEEL STEER ANGLES*
(For locked front wheels or displaced rear axles only)

RF ± NA
LF ± NA
RR ± NA
LR ± NA

Within ± 5°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	30"	2"	2"	1.50"	1.75"	2"	2.25"	+22"
2								
3								
4								

NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

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2

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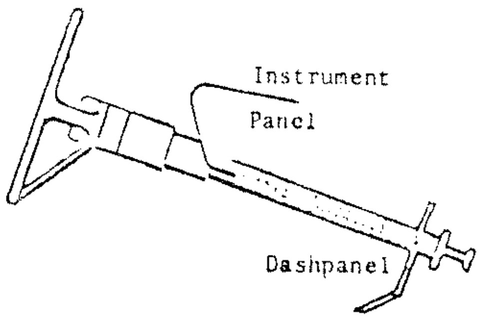
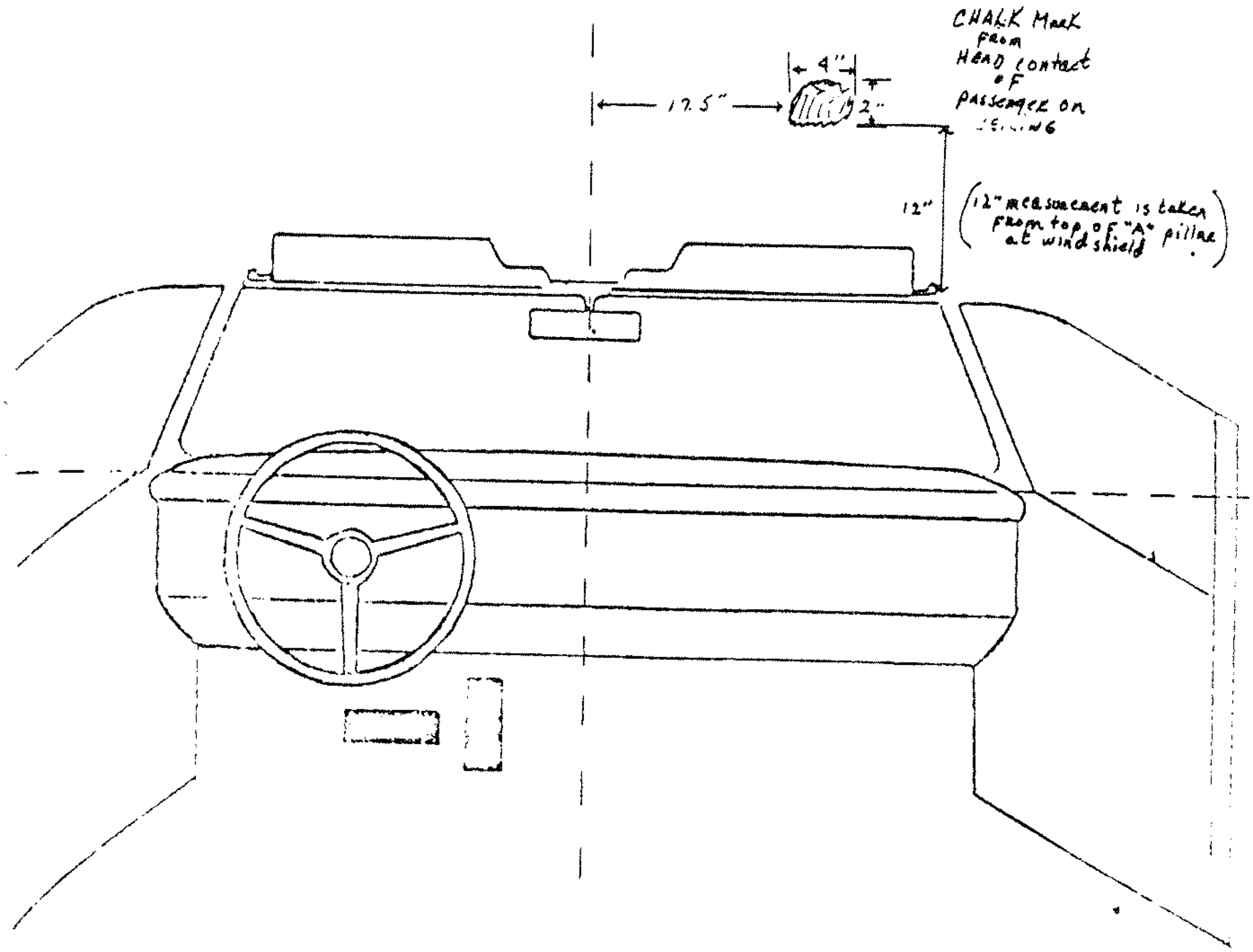
Figure 9-3

OCCUPANT CONTACT DATA
TEST NO. 3 - CAR NO. 1

VEHICLE INTERIOR

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

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5

V

TEAM	YEAR	MONTH	DAY	SEQUENCE
__	8	0 4	1 8	__ __ __

TABLE 9-2

TEST NO. 3 - CAR NO. 2

VEHICLE DATA

Vehicle data not collected. Reason? ________

Vehicle No. 2

14-15 No. of VIN Characters 1 1

16-22 VIN (Left Justify, Omit Production Numbers) 4 T 1 0 X 1 1 1 2 1 1 8

23-27 Make/Model (CPIR Code) FORD / PINTO

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more
99999 = Unknown __ __ __ __ __

33-34 Model Year 7 4

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 2,4 0 0

40-42 Occupant and Cargo Only __ __, __ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 3	0 6 B Z E W 1	1	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ________	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

1

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Figure ...

VEHICLE CRUSH SCHEMATIC

TEST NO. 3 - CAP NO. 2

...MAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 2

LF 2

RR 2

LR 2

1 Yes, 2 No, 8 NA, 9 Unk.

WHEEL STEER ANGLES*

(For locked front wheels or displaced rear axles only)

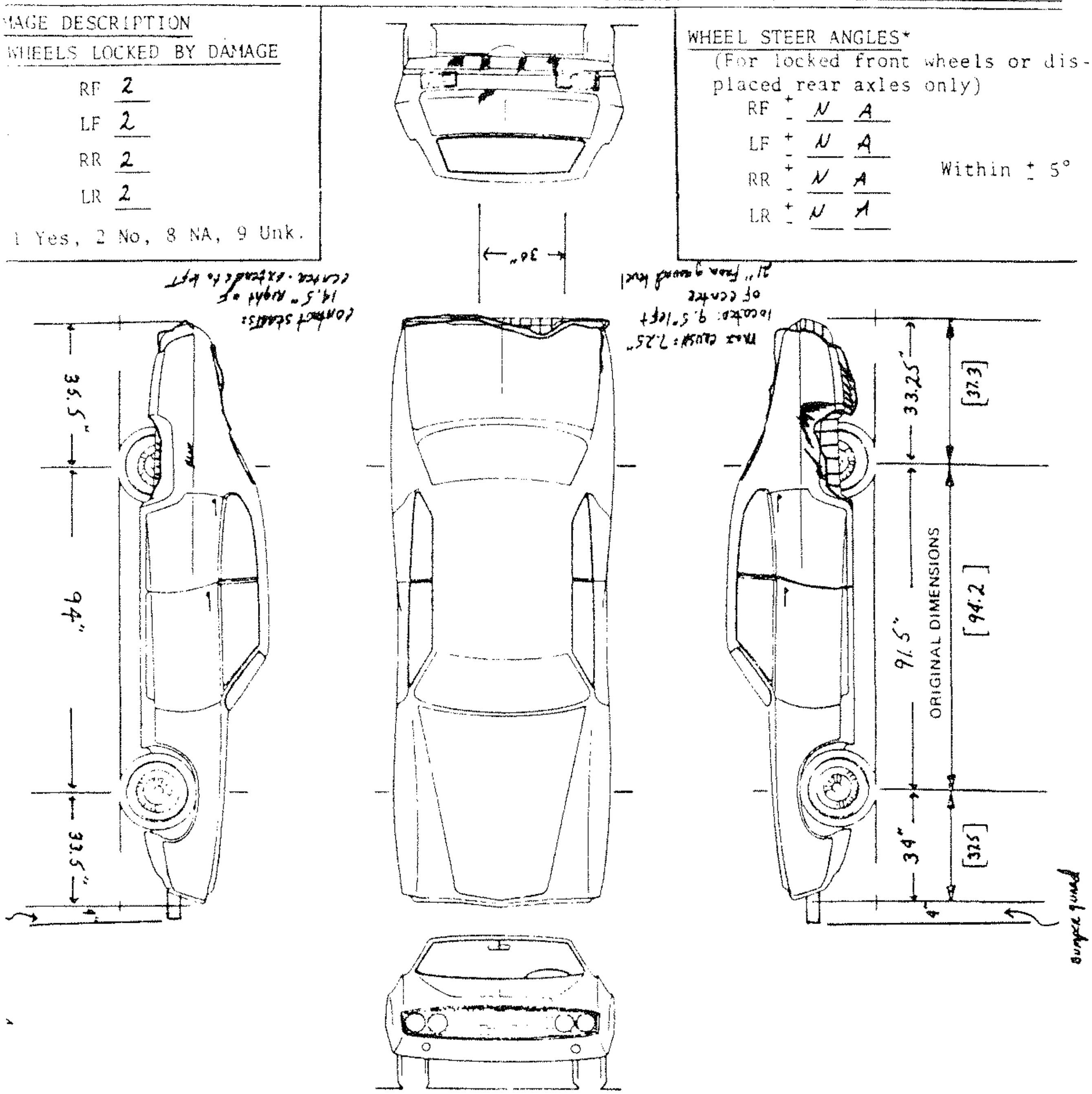
RF ± N A

LF ± N A

RR ± N A

LR ± N A

Within ± 5°



Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	30"	6.5"	6.75"	5.75"	5"	3.75"	3"	-.5"
2								
3								
4								

NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

/77 2

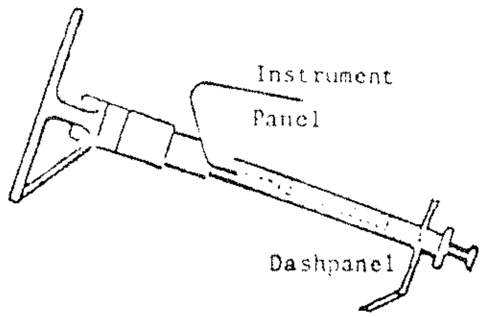
Figure 9-5

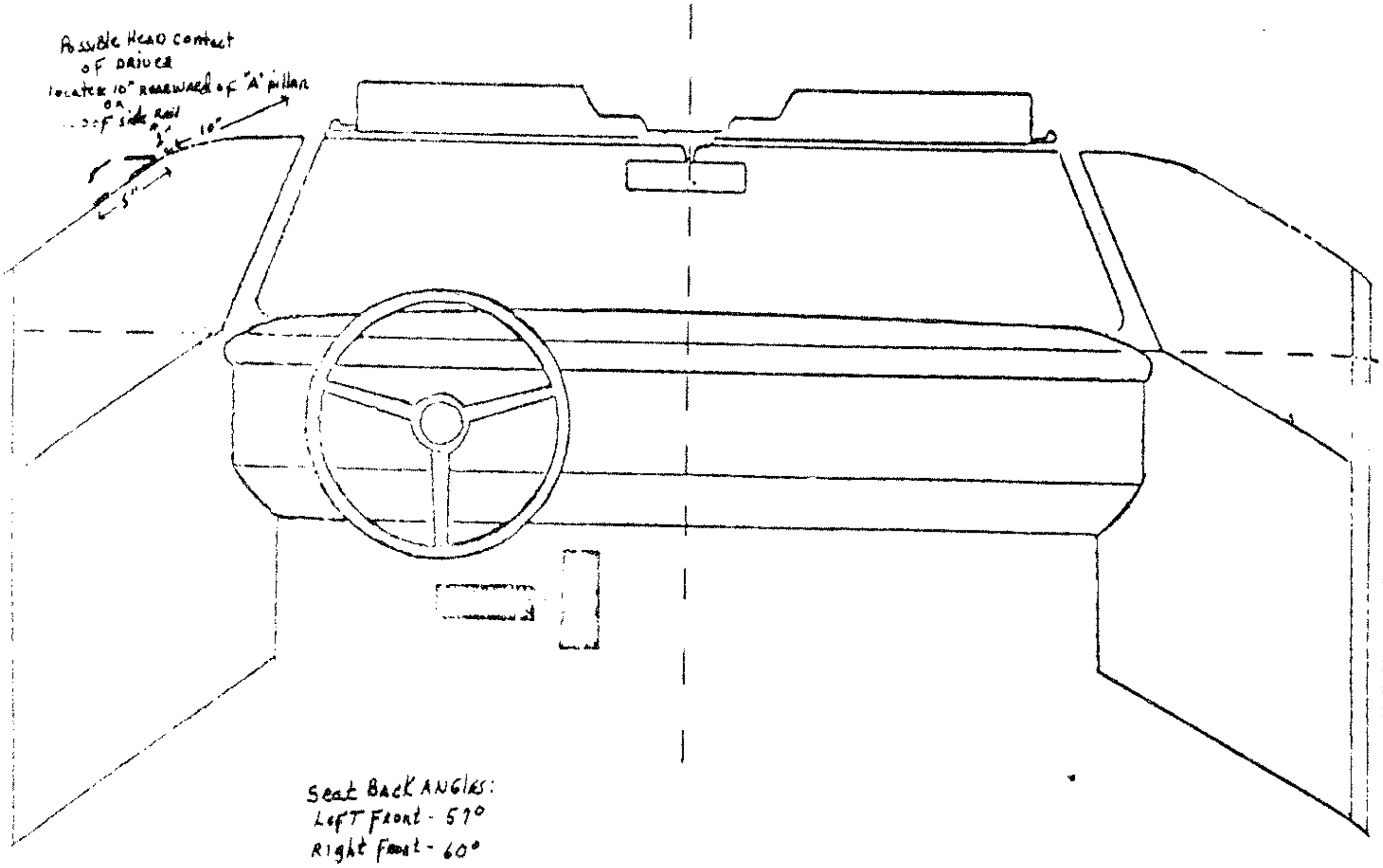
OCCUPANT CONTACT DATA

TEST NO. 3 - CAR NO. 2

VEHICLE INTERIOR

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel windshield area and top of panel for measurement purposes.

5

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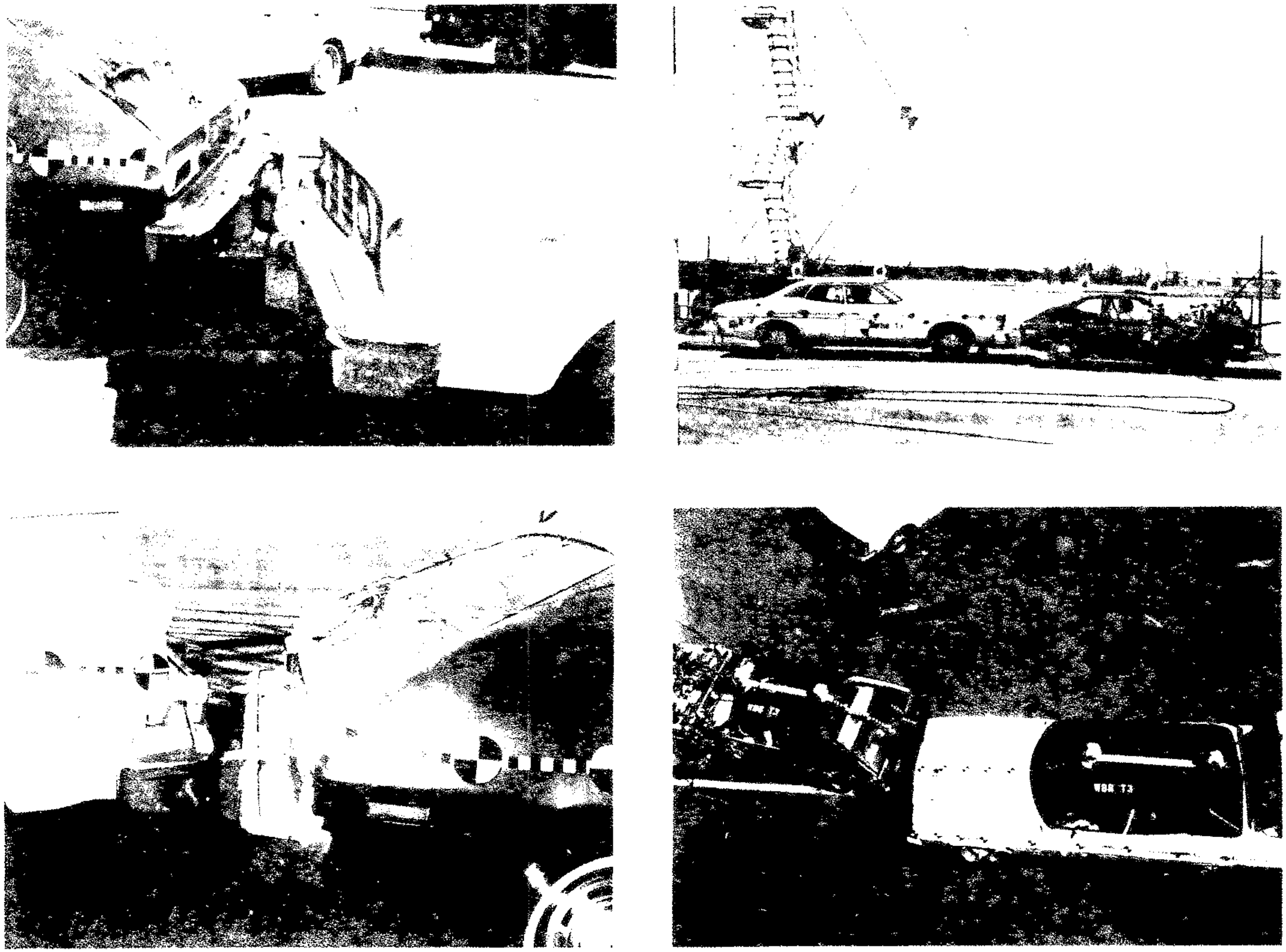


Figure 3-6 TEST NO. 3 – PRE TEST, COLLISION CONFIGURATION

Figure 9-7 TEST NO. 3 — POST TEST COLLISION SCENE

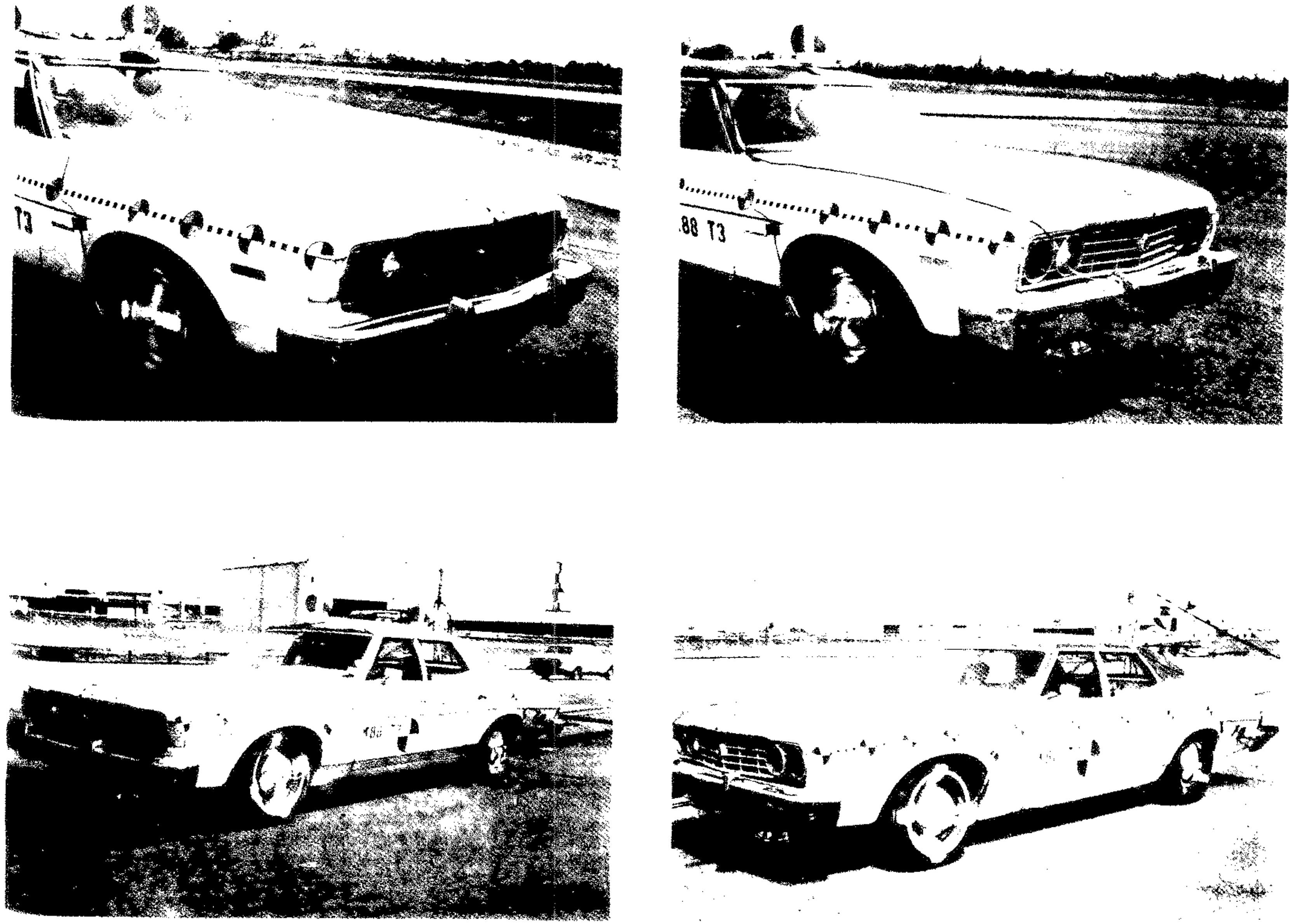


Figure 9-8 TEST NO. 3 — PRE AND POST EXTERIOR VIEWS, CAR NO. 1 - TORINO

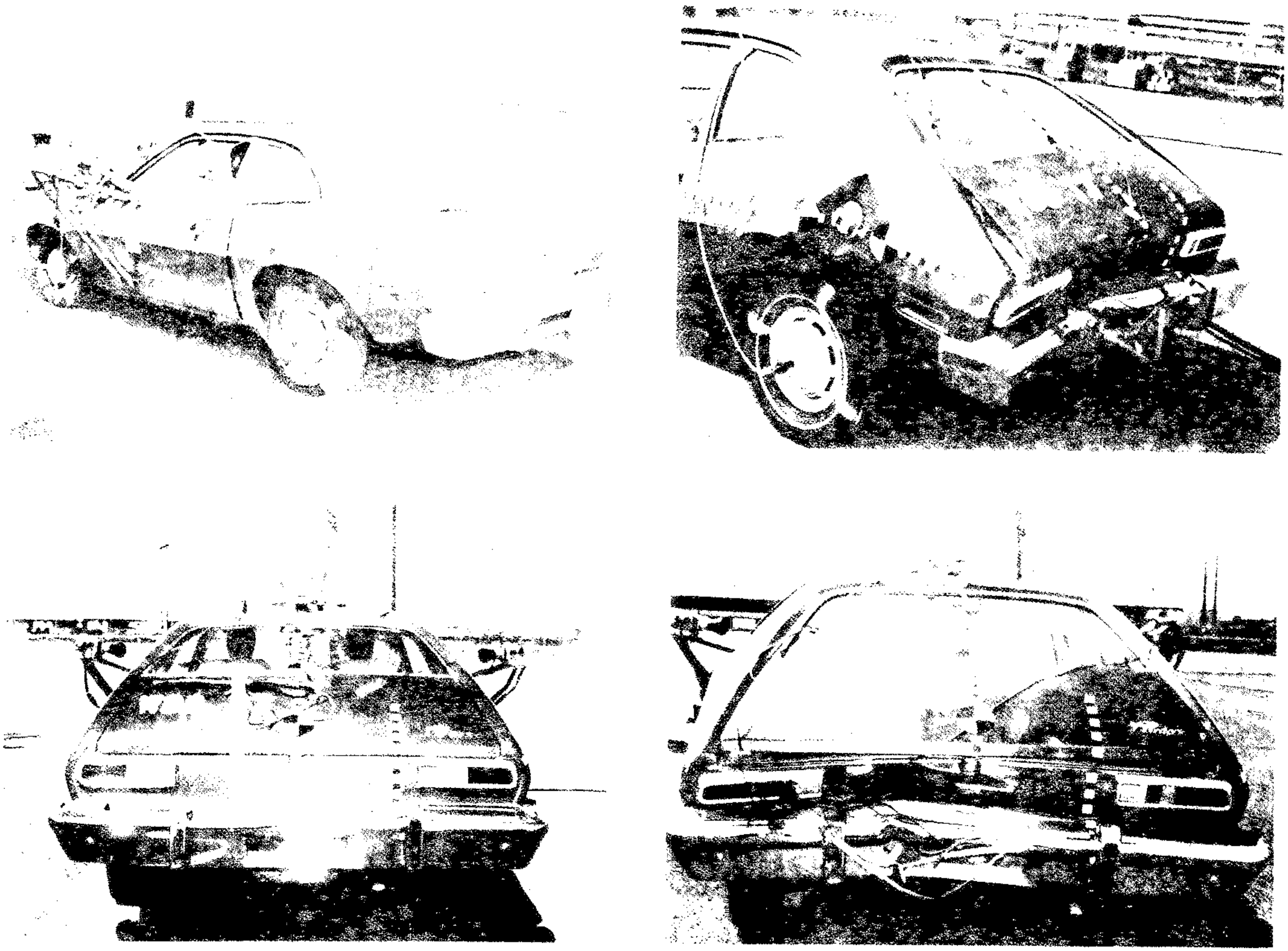


Figure 9-? TEST NO. 3 – PRE AND POST EXTERIOR VIEWS, CAR NO. 2 - PINTO

Figure [illegible] TEST NO. 3 — PRE AND POST INTERIOR VIEWS, CAR NO. 1 - TORINO

Figure 9-11 TEST NO. 3 – PRE AND POST INTERIOR VIEWS, CAR NO. 2 - PINTO

TABLE 9-3

ELECTRONIC INSTRUMENTATION TEST No. 3

BULLETT VEHICLE - CAR 1 - 1974 FORD TORINO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION*	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	Left Front Corner
2	X,Y,Z	Floorpan R.R. Corner	Right Rear Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Rear Deck	Rear Deck
5	X	Bumper	Bumper
VEHICLE ATTITUDE			
Pitch Angle - 6		Gyro Package	Vehicle Pitch Angle
Roll Angle - 6		Gyro Package	Vehicle Roll Angle
Yaw Angle - 6		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 6		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle - Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.R. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
7	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 9-12 VEHICLE INSTRUMENTATION LOCATIONS

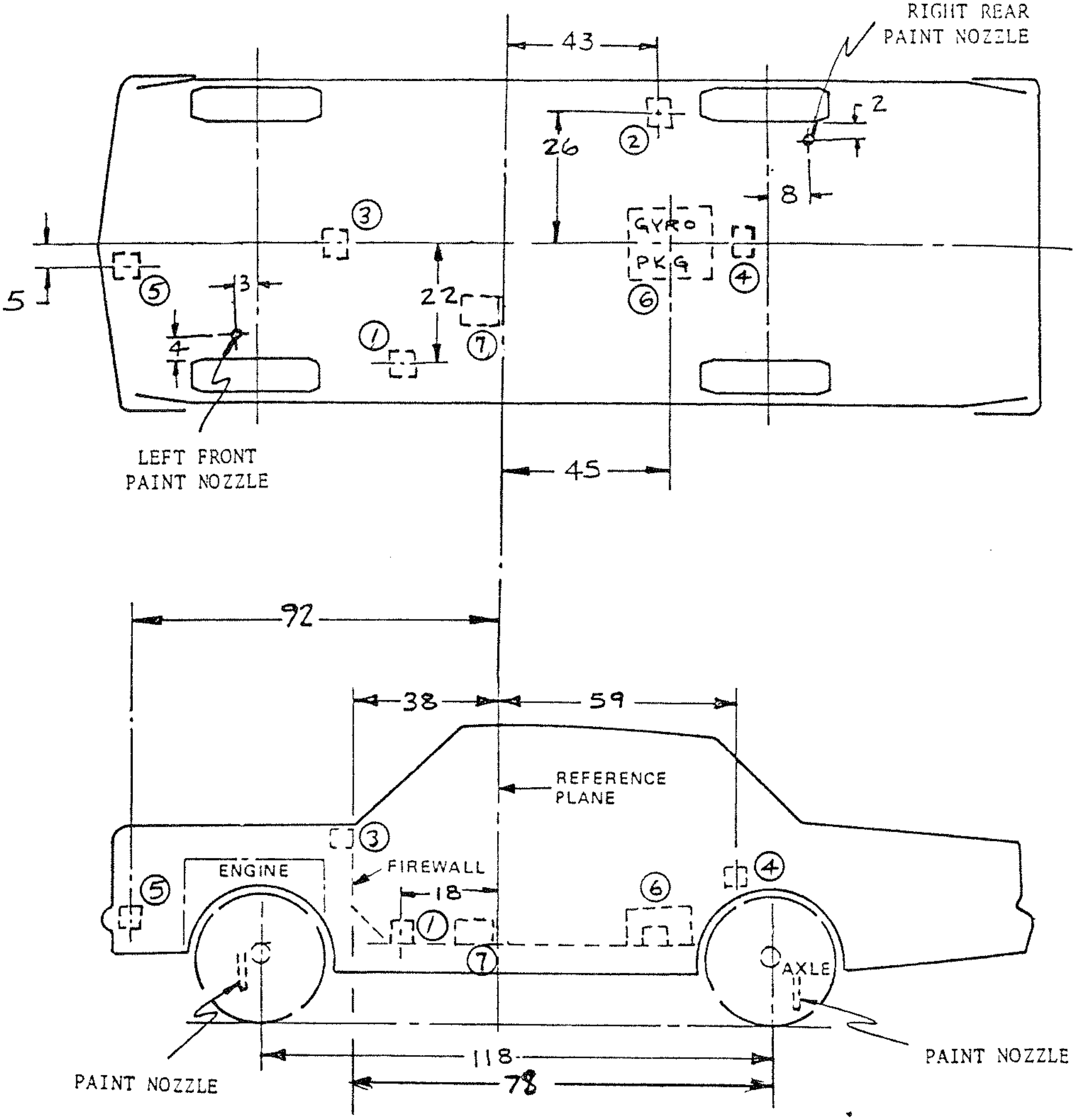


Figure 9-12 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 1 - 1974 FORD TORINO - TEST NO. 3

TABLE 9-4

ELECTRONIC INSTRUMENTATION TEST No. 3

TARGET VEHICLE - CAR 2 - 1974 FORD PINTO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	L.F. Corner
2	X,Y,Z	Floorpan L.R. Corner	R.F. Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Rear Deck	Rear Deck
VEHICLE ATTITUDE			
Pitch Angle - 5		Gyro Package	Vehicle Pitch Angle
Roll Angle - 5		Gyro Package	Vehicle Roll Angle
Yaw Angle - 5		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 5		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle - Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.F. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
DUMMY			
L.F. Head	X,Y,Z	L.F. Seat	Dummy L.F. Head
L.F. Chest	X,Y,Z	L.F. Seat	Dummy L.F. Chest
L.F. Femurs	R,L**	L.F. Seat	Dummy L.F. Femur
L.F. Pelvic	X	L.F. Seat	Dummy L.F. Pelvic
R.F. Head	X,Y,Z	R.F. Seat	Dummy R.F. Head
R.F. Chest	X,Y,Z	R.F. Seat	Dummy R.F. Chest
R.F. Femurs	R,L**	R.F. Seat	Dummy R.F. Femur
R.F. Pelvic	X	R.F. Seat	Dummy R.F. Pelvic
6	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 9-13 VEHICLE INSTRUMENTATION LOCATIONS

**RIGHT AND LEFT FORCES

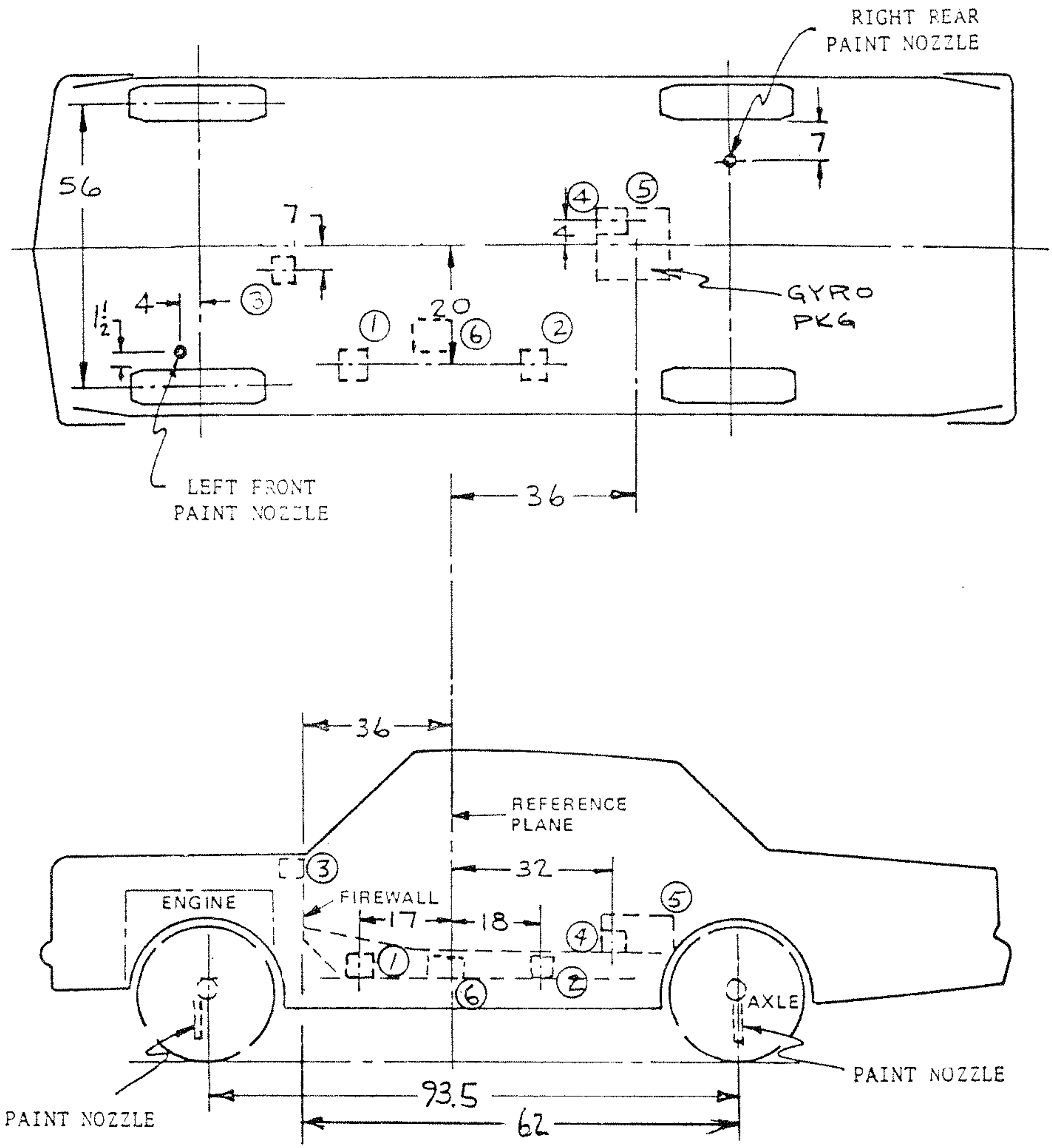


Figure 9-13 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 2 - 1974 FORD PINTO - TEST NO. 3

TABLE 9-5

VEHICLE TEST WEIGHTS - TEST NO. 3

BULLET VEHICLE

CAR 1 - 1974 FORD TORINO

Left Front	1310 lbs.	Left Rear	1170 lbs.
Right Front	1310 lbs.	Right Rear	1190 lbs.
Total Front	2620 lbs.	Total Rear	2360 lbs.

Total Weight = 2620 lbs. + 2360 lbs. = 4980 lbs.

Wheel Base 117.5 in.

$Cg_{FW} = \frac{2360 \text{ lbs.}}{4980 \text{ lbs.}}$ 117.5 in. = 55.68 in.

TARGET VEHICLE

CAR 2 - 1974 FORD PINTO

Left Front	960 lbs.	Left Rear	620 lbs.
Right Front	930 lbs.	Right Rear	630 lbs.
Total Front	1890 lbs.	Total Rear	1250 lbs.

Total Weight = 1890 lbs. + 1250 lbs. = 3140 lbs.

Wheel Base 94 in.

$Cg_{FW} = \frac{1250 \text{ lbs.}}{3140 \text{ lbs.}}$ 94 in. = 37.42 in.

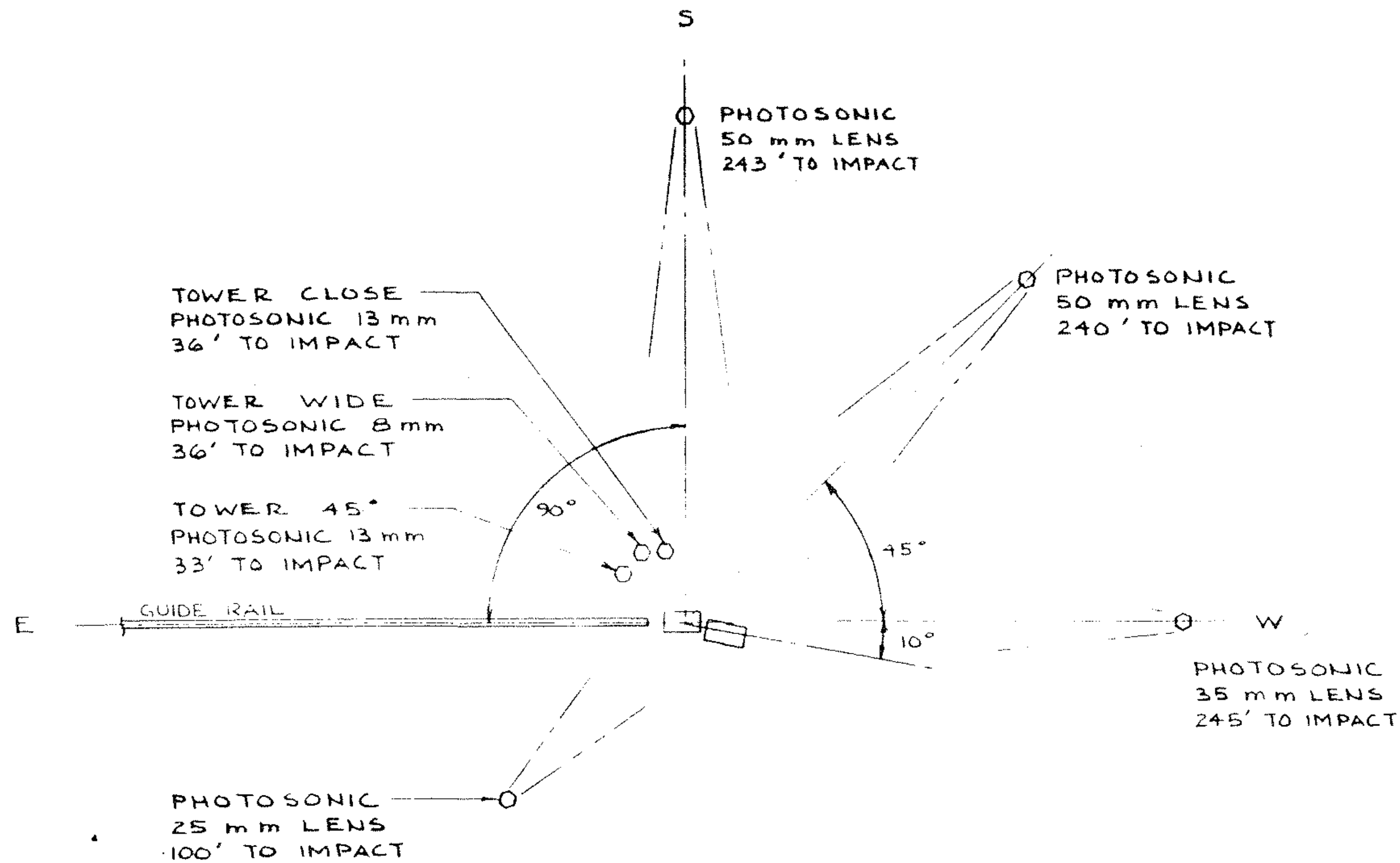


Figure 9-14

STAGED COLLISION SCENE
& CAMERA LOCATIONS
TESTS 3, ___ ___

TABLE 9- 6

DATA CAMERA LOG

PROJECT - RICSAC

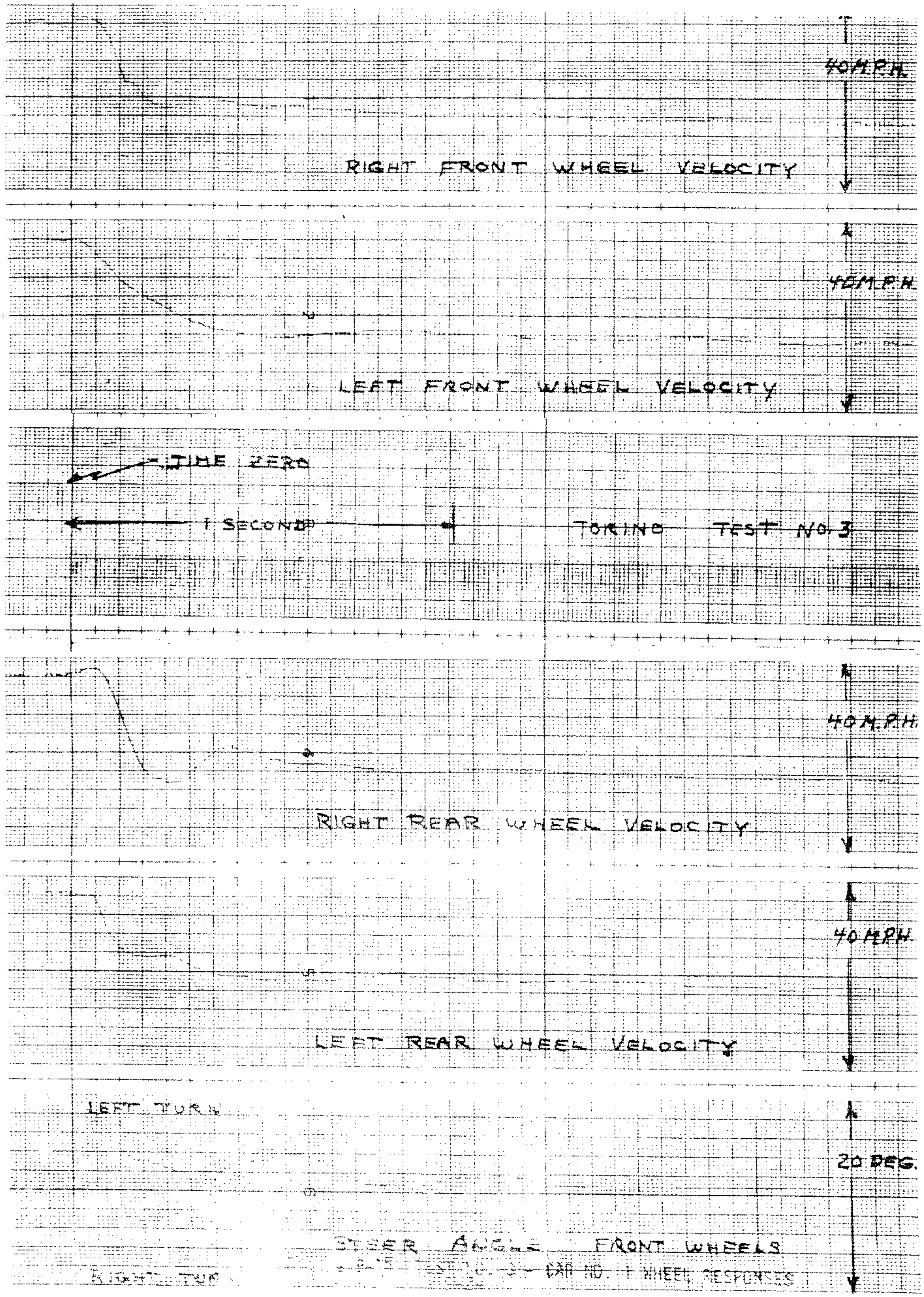
Test No. 3
Date: April 14, 1978

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	SOUTH	PHOTOSONIC	50 MM	1000
2	WEST	PHOTOSONIC	35 MM	800
3	NORTHEAST	PHOTOSONIC	25 MM	900
4	TOWER 45	PHOTOSONIC	13 MM	NO PULSE
5	TOWER WIDE	PHOTOSONIC	8 MM	600
6	TOWER CLOSE	PHOTOSONIC	13 MM	600
7	O.B. DRIVER	STALEX	8 MM	1400
8	O.B. HOOD	STALEX	8 MM	1525
9.	O.B. PASS.	STALEX	8 MM	1500

NOTE: 1. CAMERAS ARE LISTED ACCORDING TO SPLICING SEQUENCE OF FILM.

2. REAL TIME MOVIE FILM COVERAGE OF PRE- AND POST-CRASH AND CRASH EVENT ARE SPLICED AT START AND END OF FILM (24 fps).

3. FOR CAMERA LOCATIONS AND DISTANCE TO SUBJECT SEE FIGURE


40 M.P.H.
RIGHT FRONT WHEEL VELOCITY
40 M.P.H.
LEFT FRONT WHEEL VELOCITY
TIME ZERO
1 SECOND
TORINO TEST NO. 3
40 M.P.H.
RIGHT REAR WHEEL VELOCITY
40 MPH
LEFT REAR WHEEL VELOCITY
LEFT TURN
20 DEG.
STEER ANGLE FRONT WHEELS
RIGHT TURN
CAR NO. 1 WHEEL RESPONSES

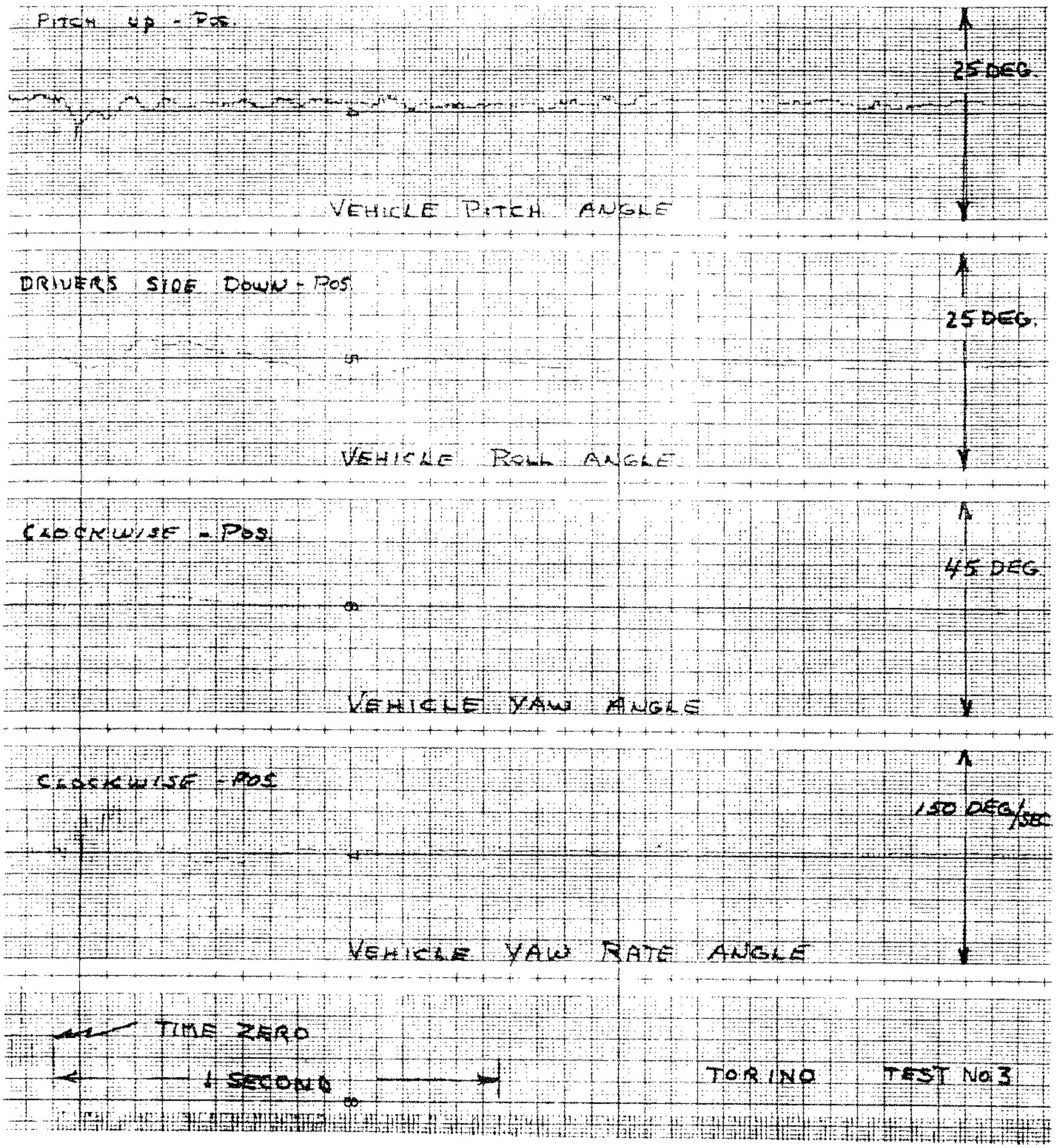


Figure TEST NO. 3
CAR NO. 1 VEHICLE ATTITUDE

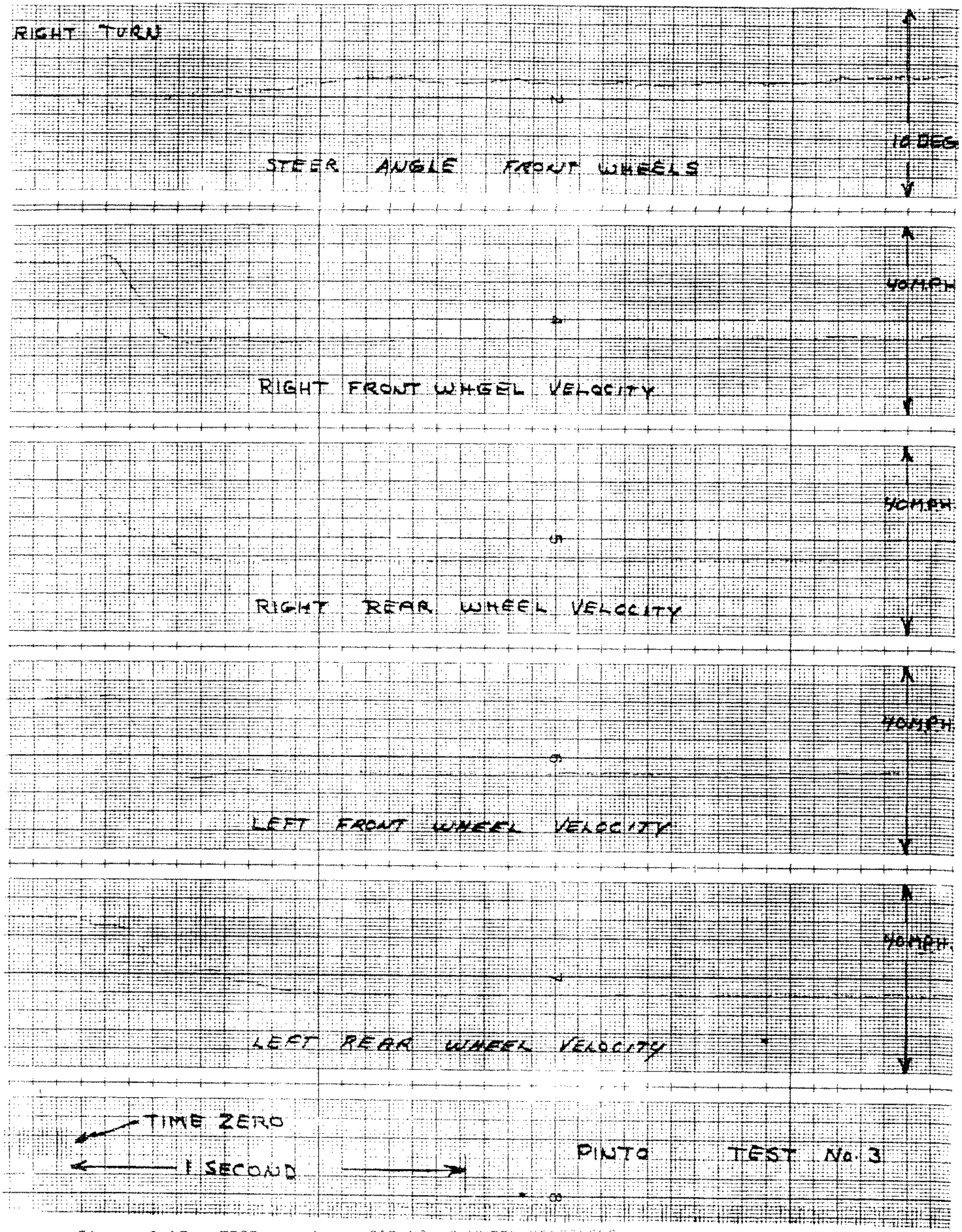


Figure 9-17 TEST NO. 3 - CAR NO. 2 WHEEL RESPONSES

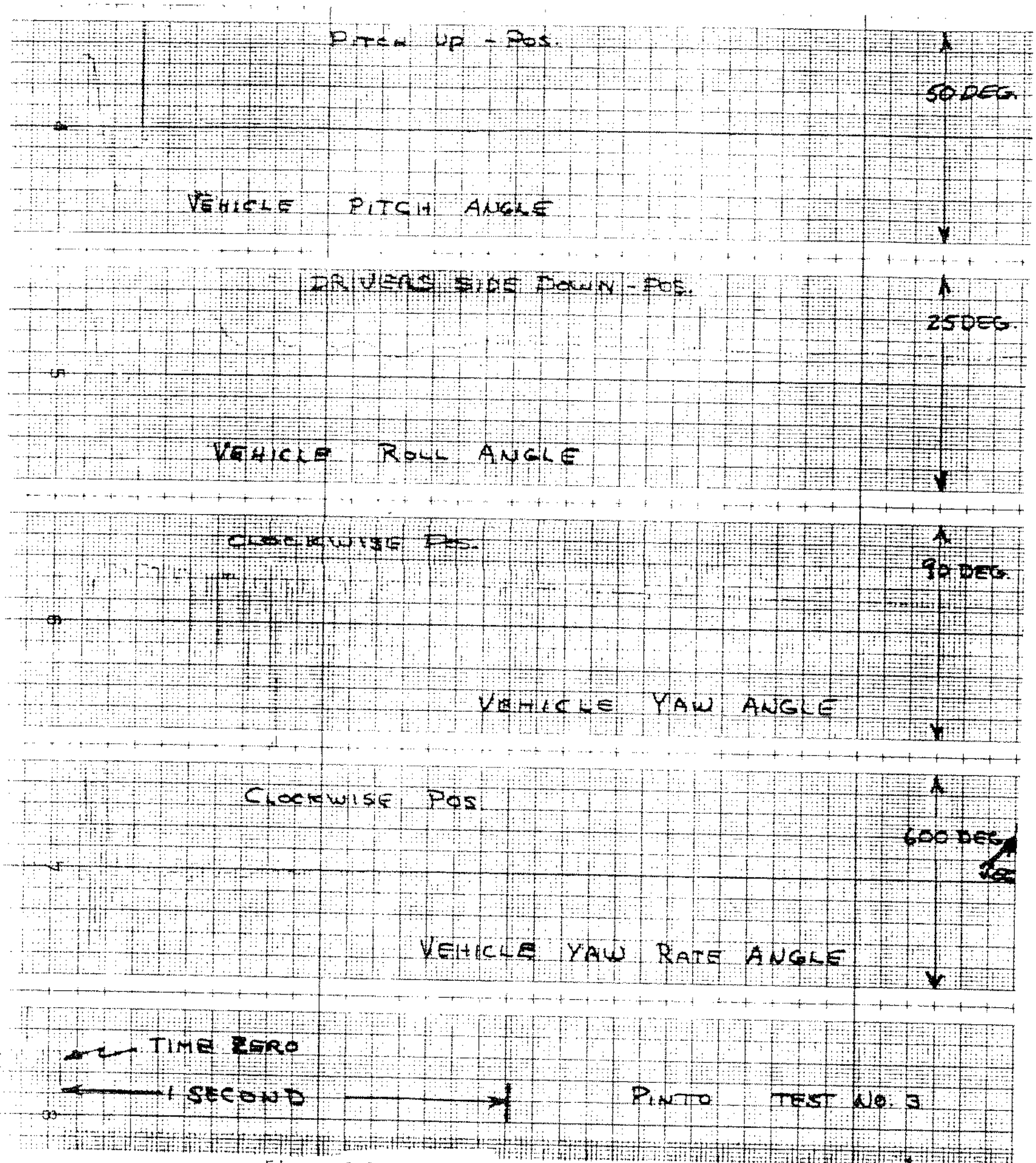


Figure 9-18 TEST NO. 3 CAR NO. 2
VEHICLE ATTITUDE

RICSAC TEST NO. 3

VEHICLE RESPONSES

CAR NO. 1 1974 FORD TORINO

DATA PLOTS

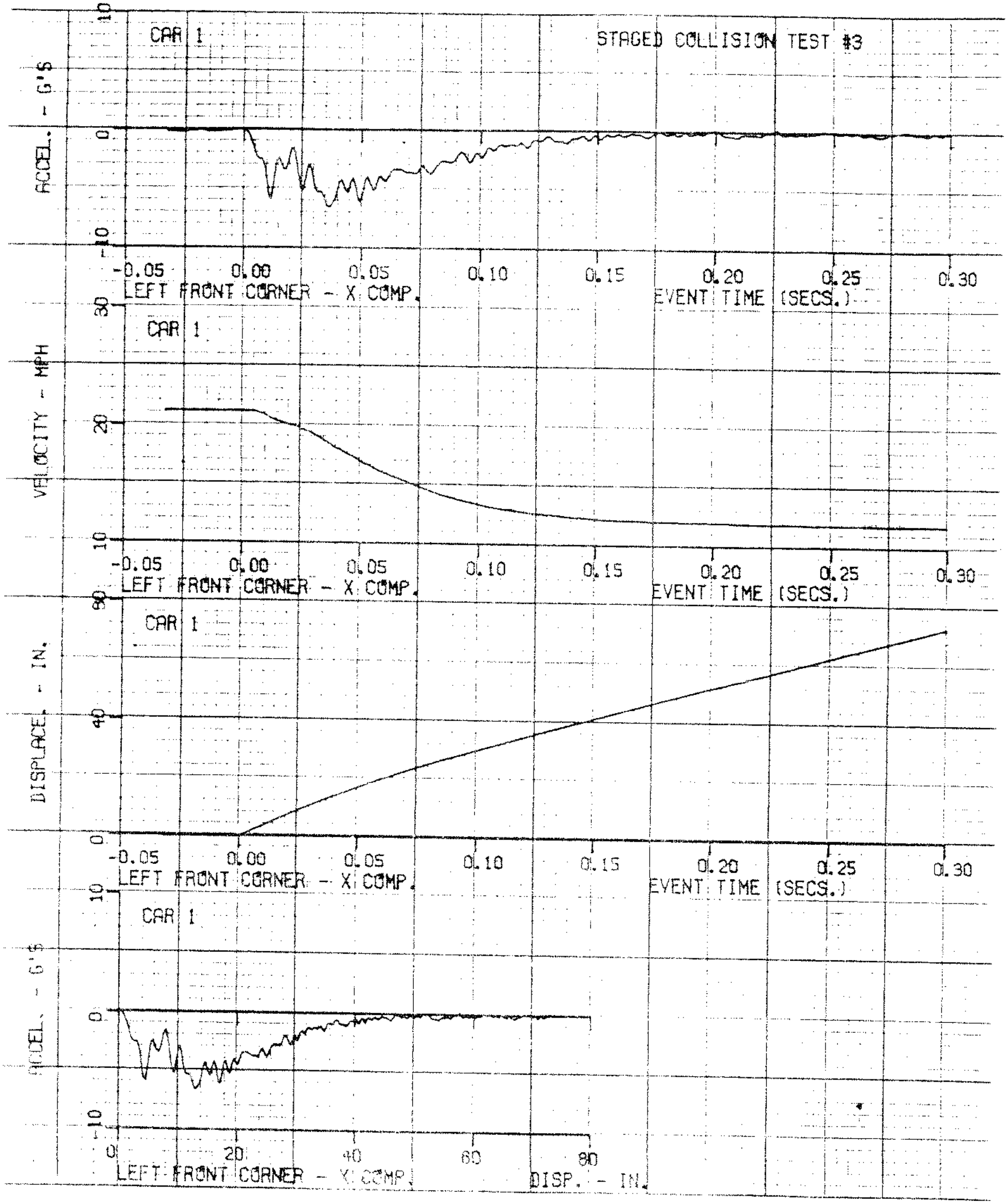
ACCELERATION TIME HISTORIES

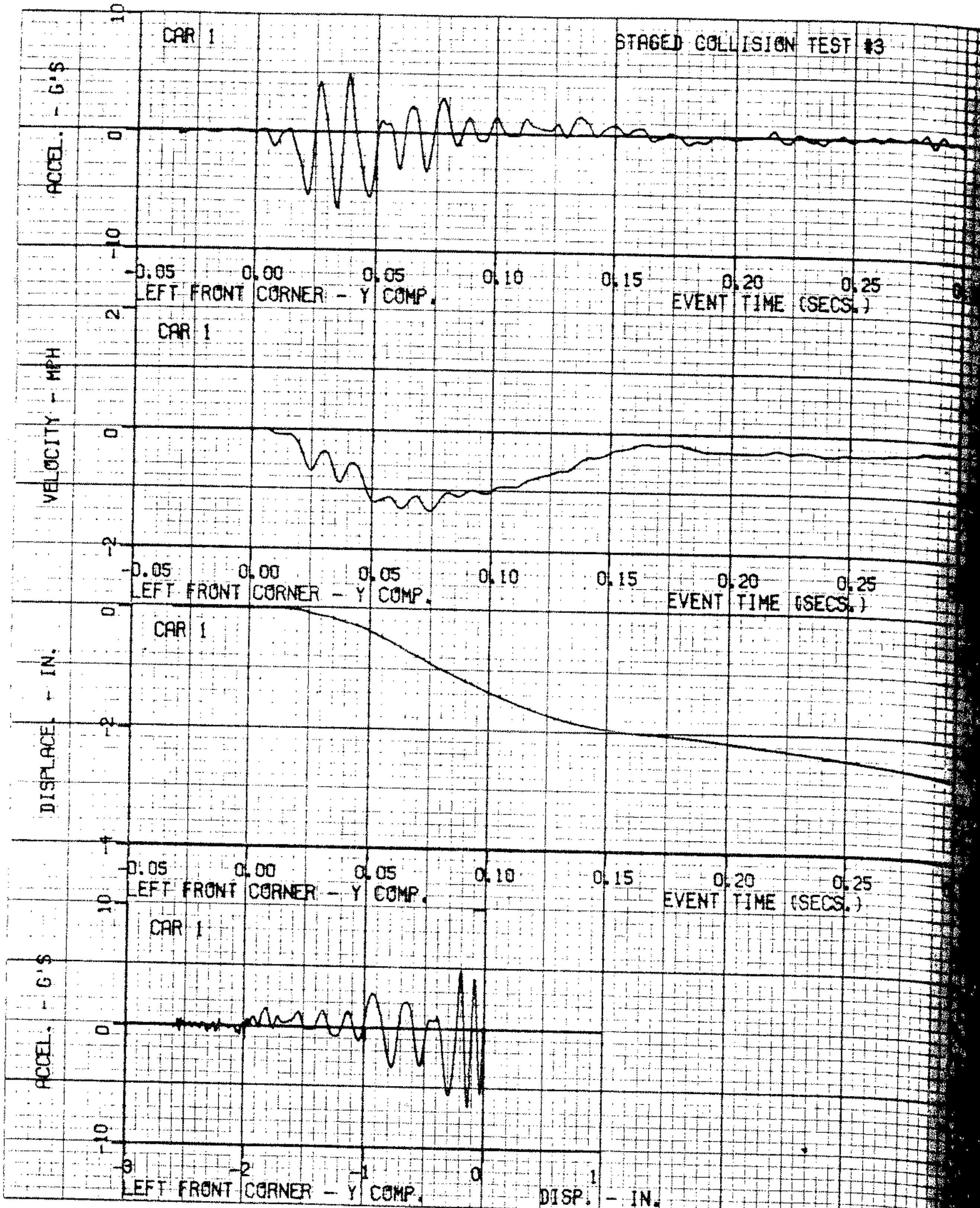
VELOCITY TIME HISTORIES

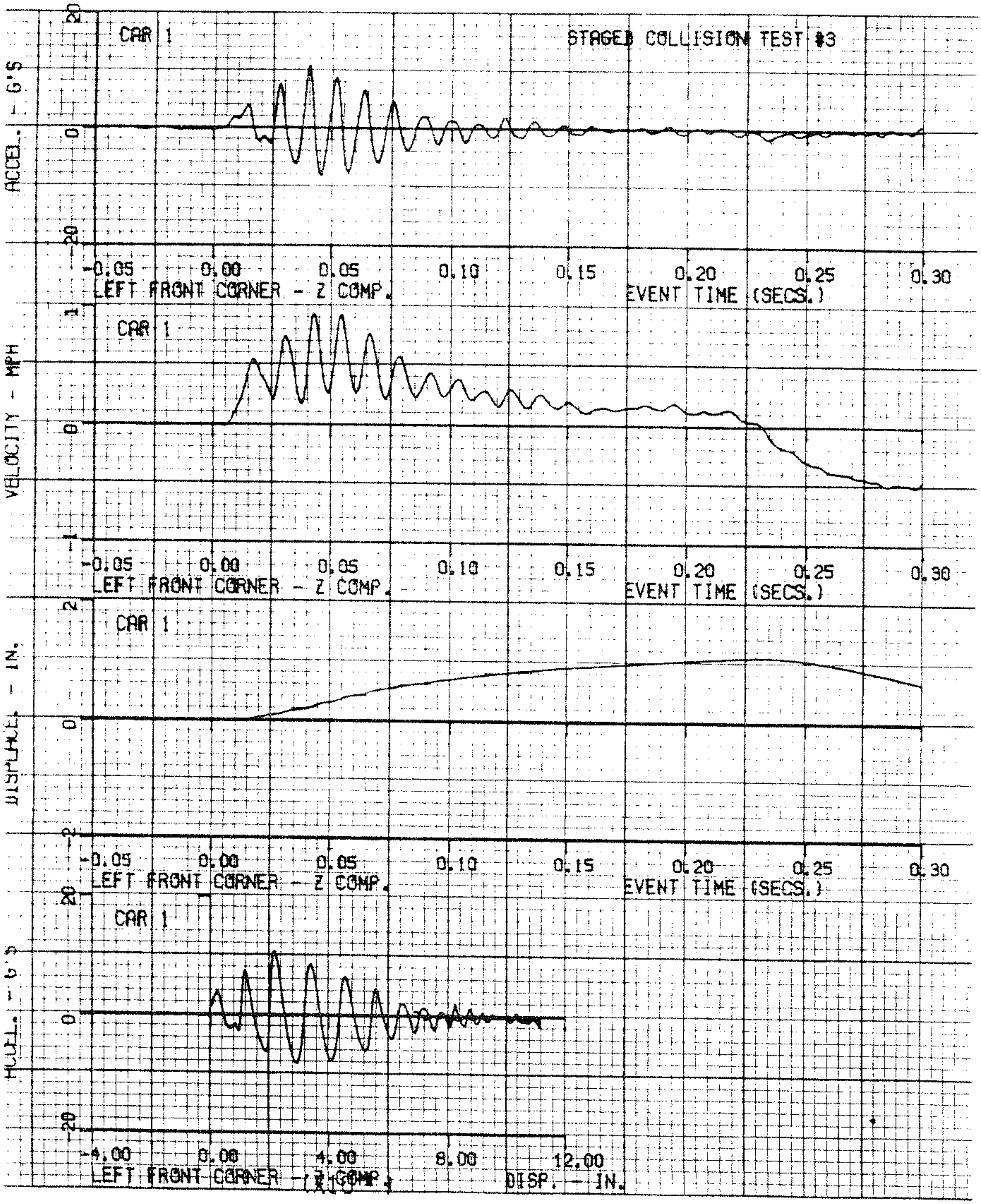
DISPLACEMENT TIME HISTORIES

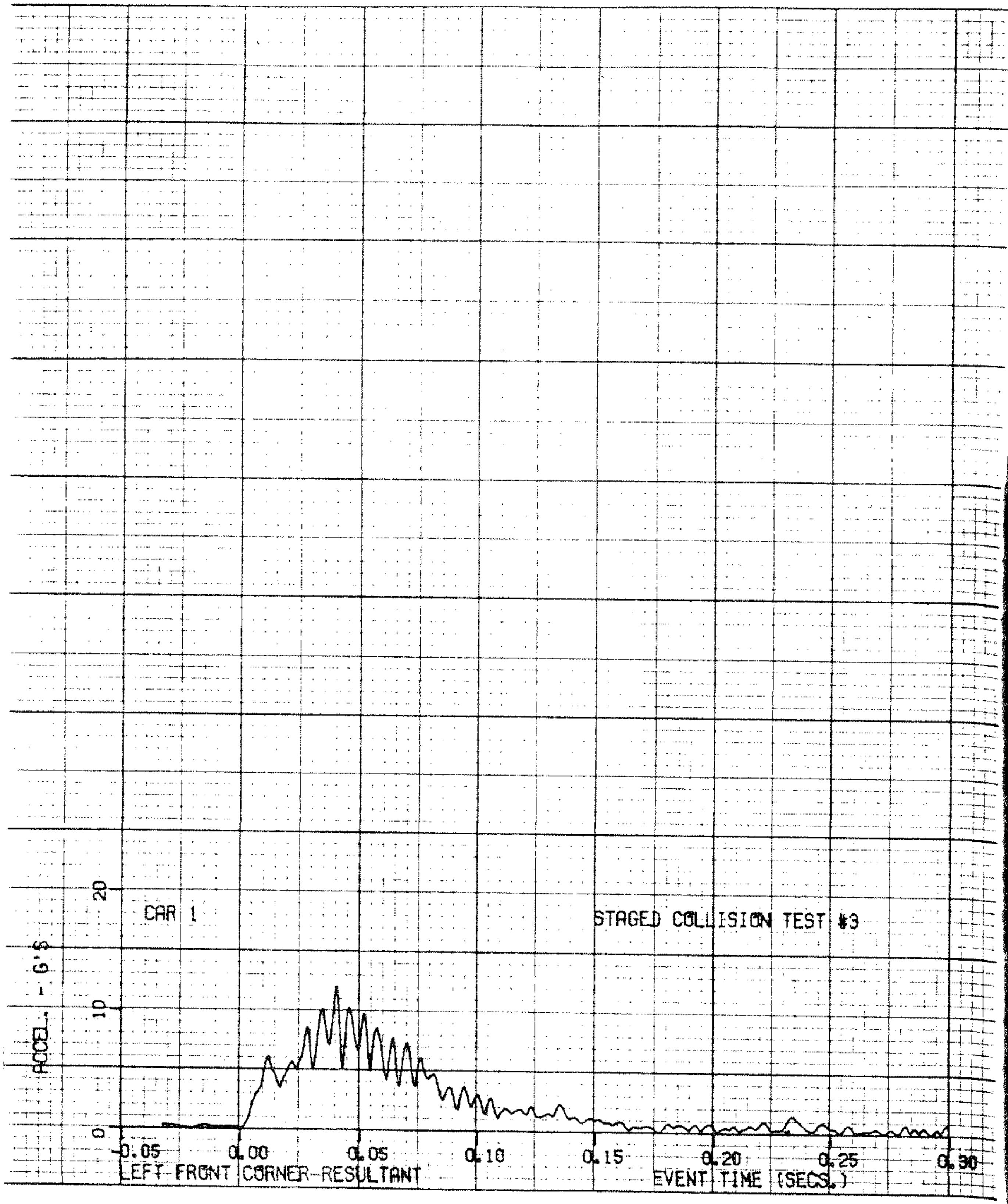
ACCELERATION VS DISPLACEMENT

FILTER CLASS 60


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
30
20
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
20
40
60
80
LEFT FRONT CORNER - X COMP.
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-2
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-3
-2
-1
0
1
LEFT FRONT CORNER - Y COMP.
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
-4.00
0.00
4.00
8.00
12.00
LEFT FRONT CORNER - Z COMP.
DISP. - IN.


ACCEL. - G'S
20
10
0
CAR 1
STAGED COLLISION TEST #3
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

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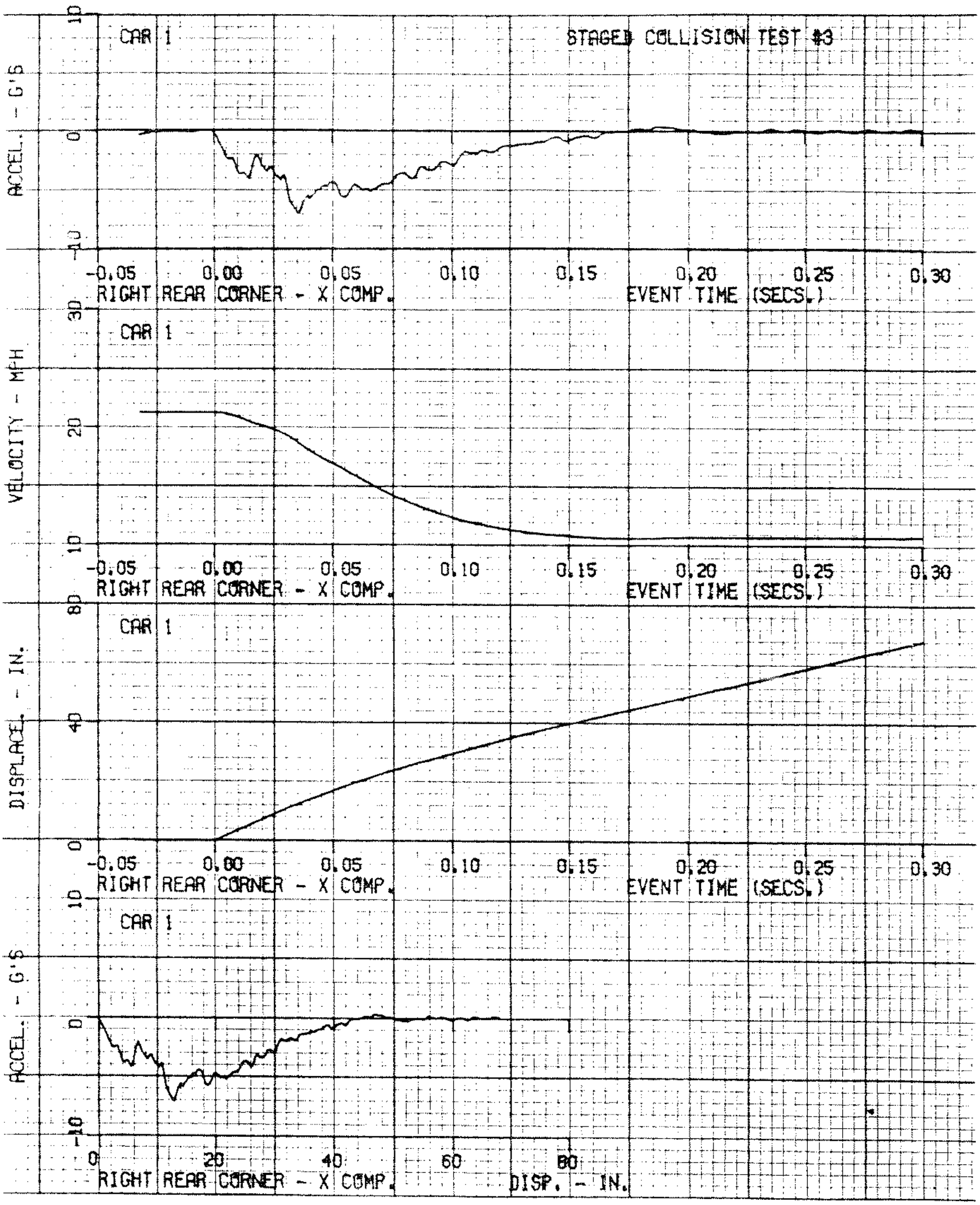
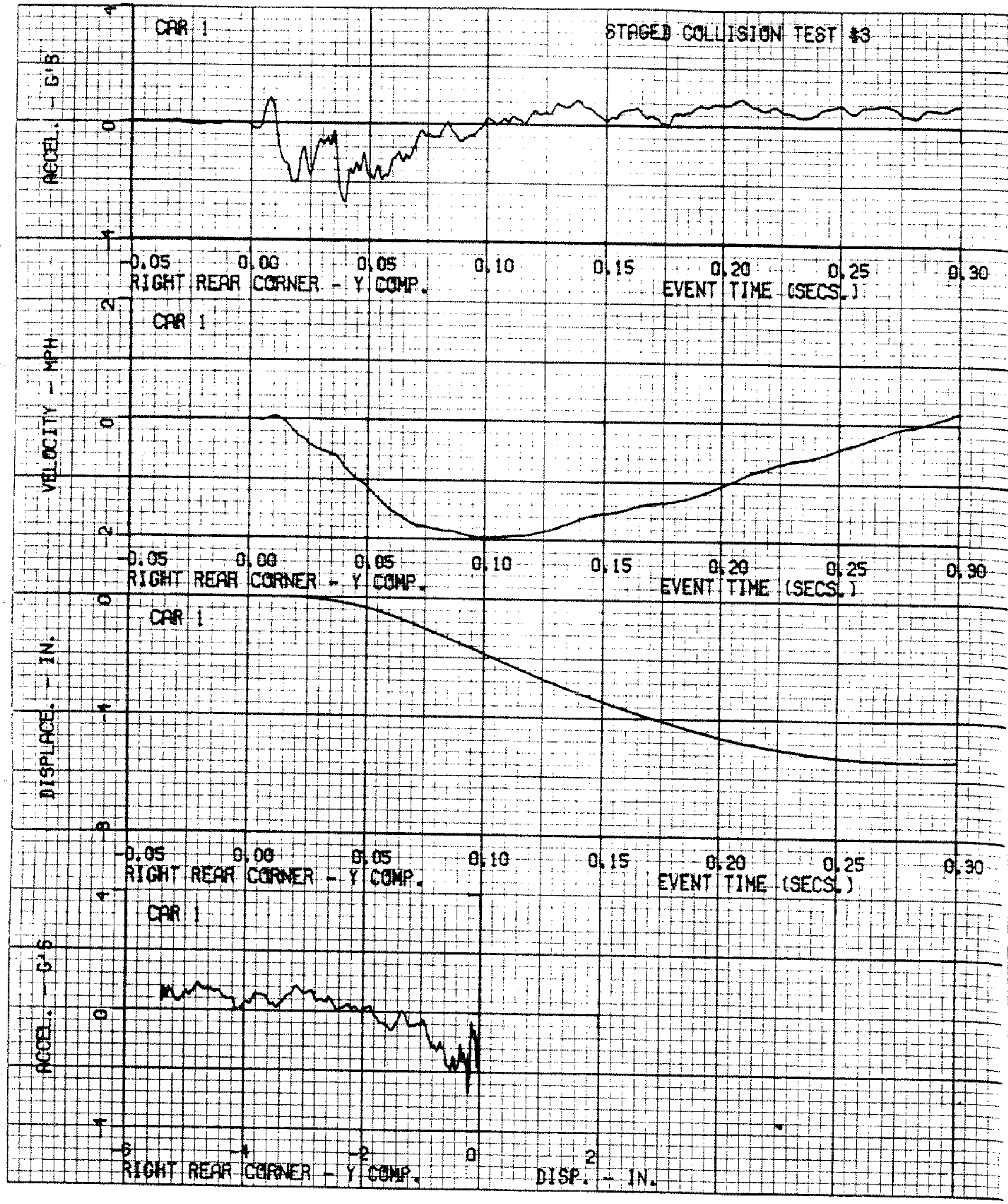
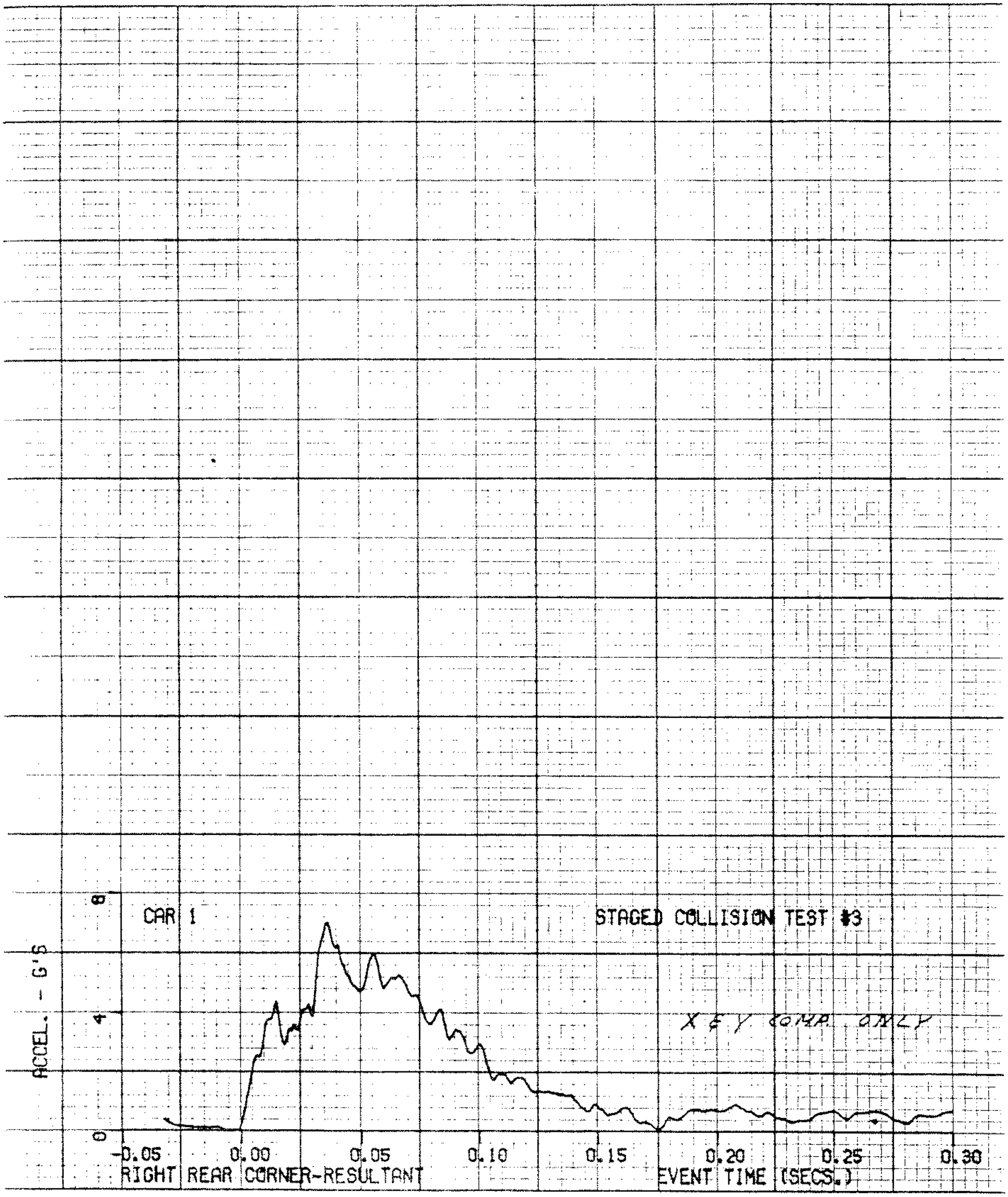
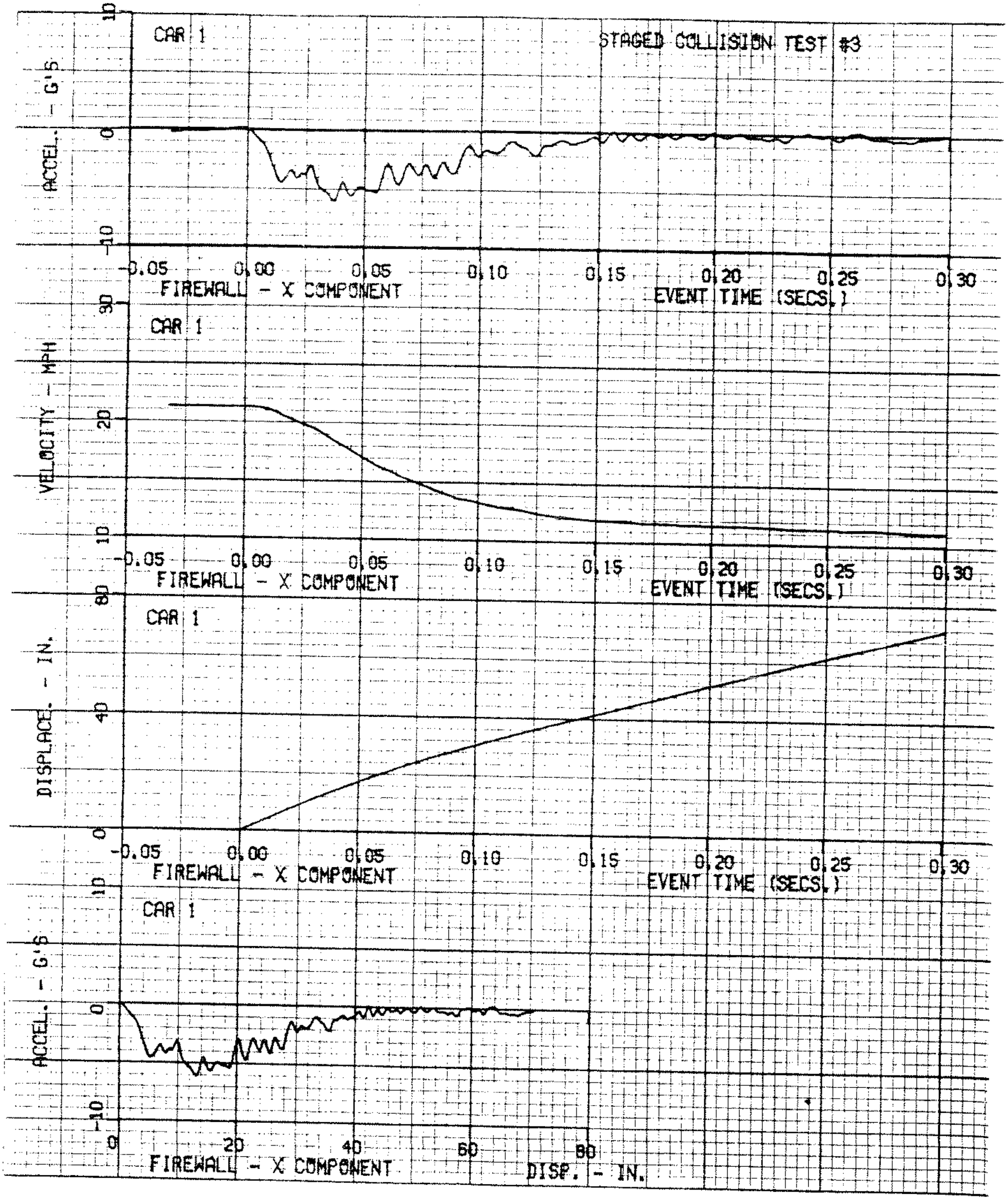

CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
30
20
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
20
40
60
80
RIGHT REAR CORNER - X COMP.
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-4
-8
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
4
0
-4
-6
-4
-2
0
2
RIGHT REAR CORNER - Y COMP.
DISP. - IN.

ZQ-6057-V-4


CAR 1
STAGED COLLISION TEST #3
X & Y COMP. ONLY
ACCEL. - G'S
8
4
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER-RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
VELOCITY - MPH
30
20
10
DISPLACE. - IN.
80
40
0
DISP. - IN.
20
40
60
80

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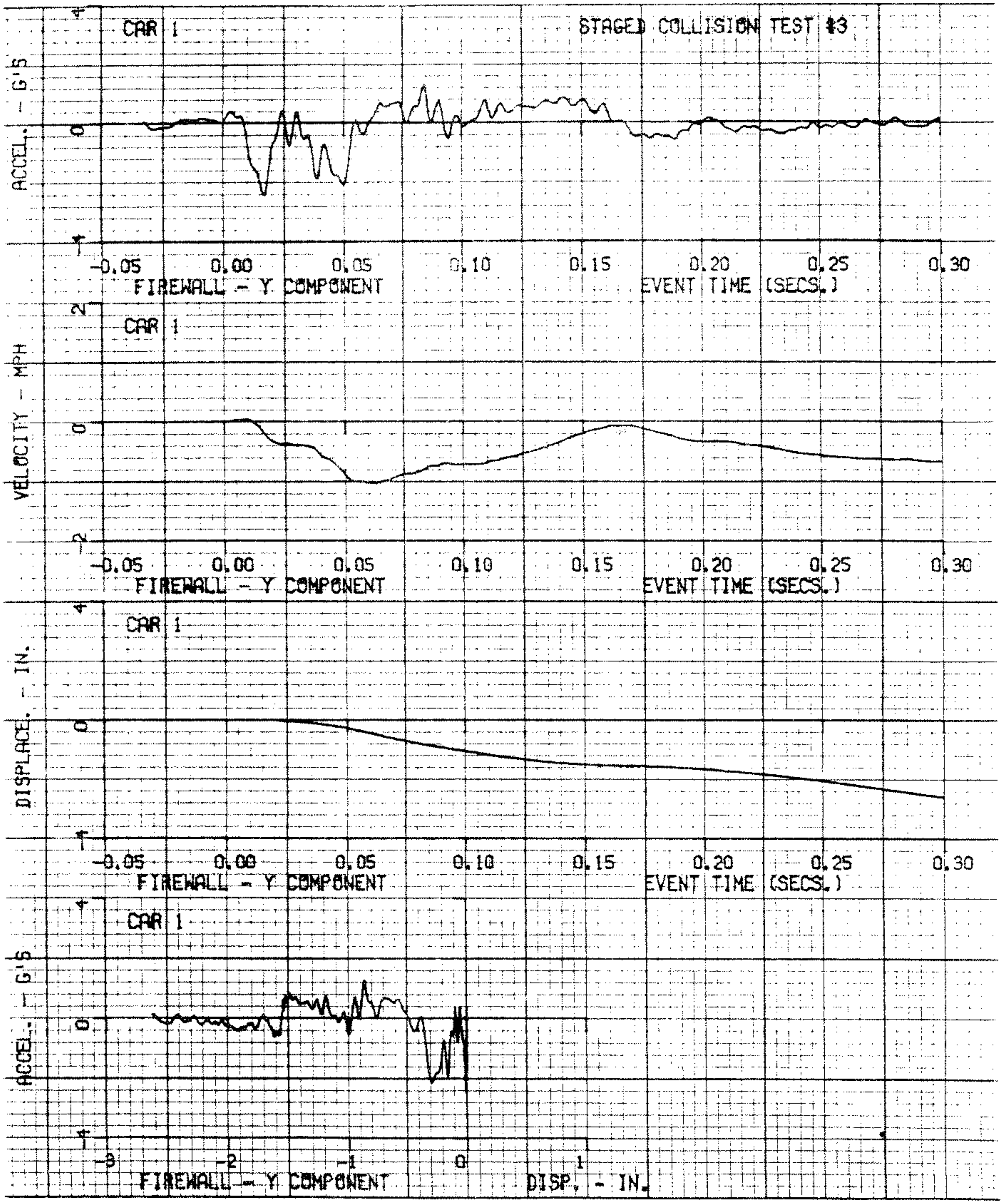
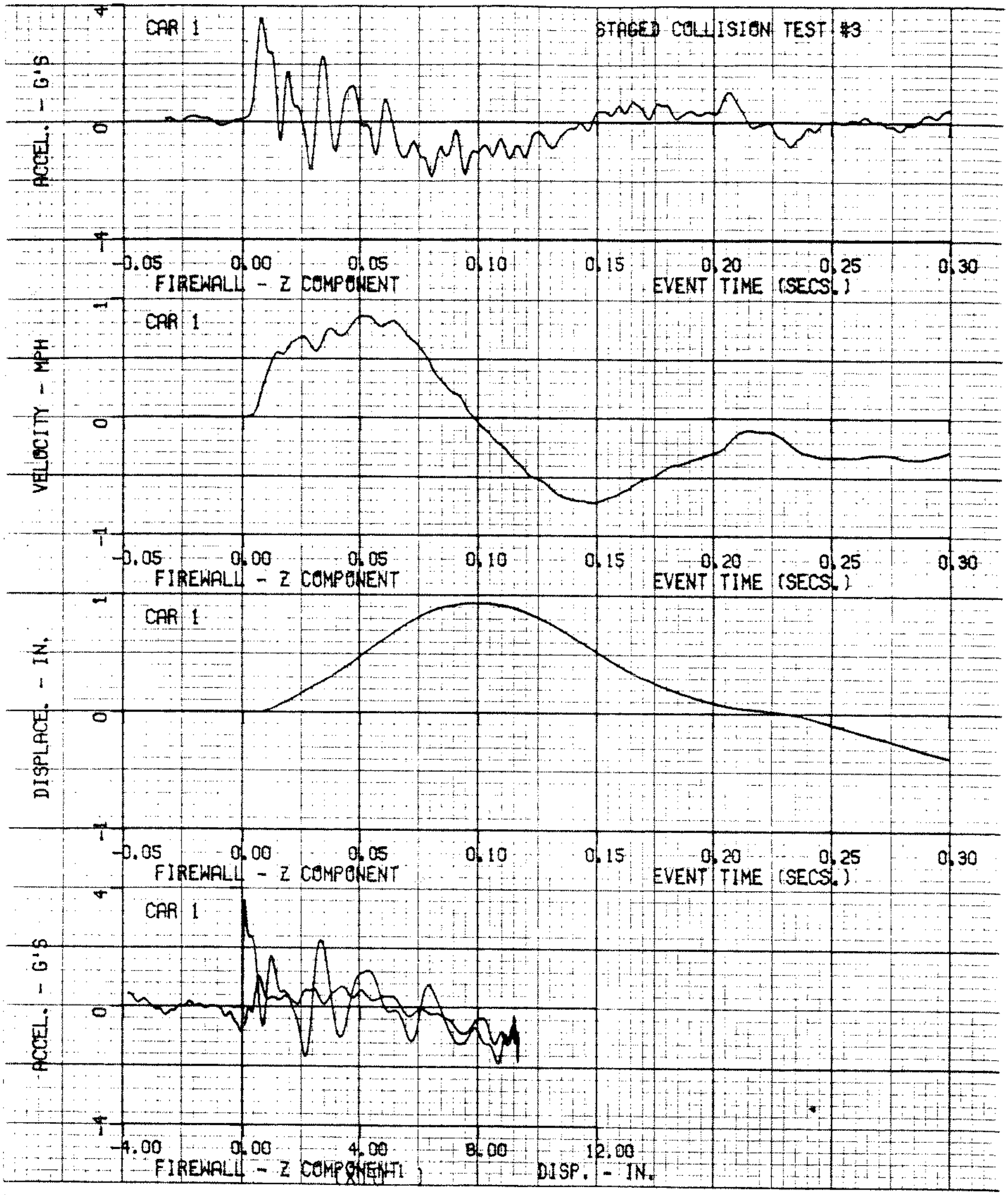
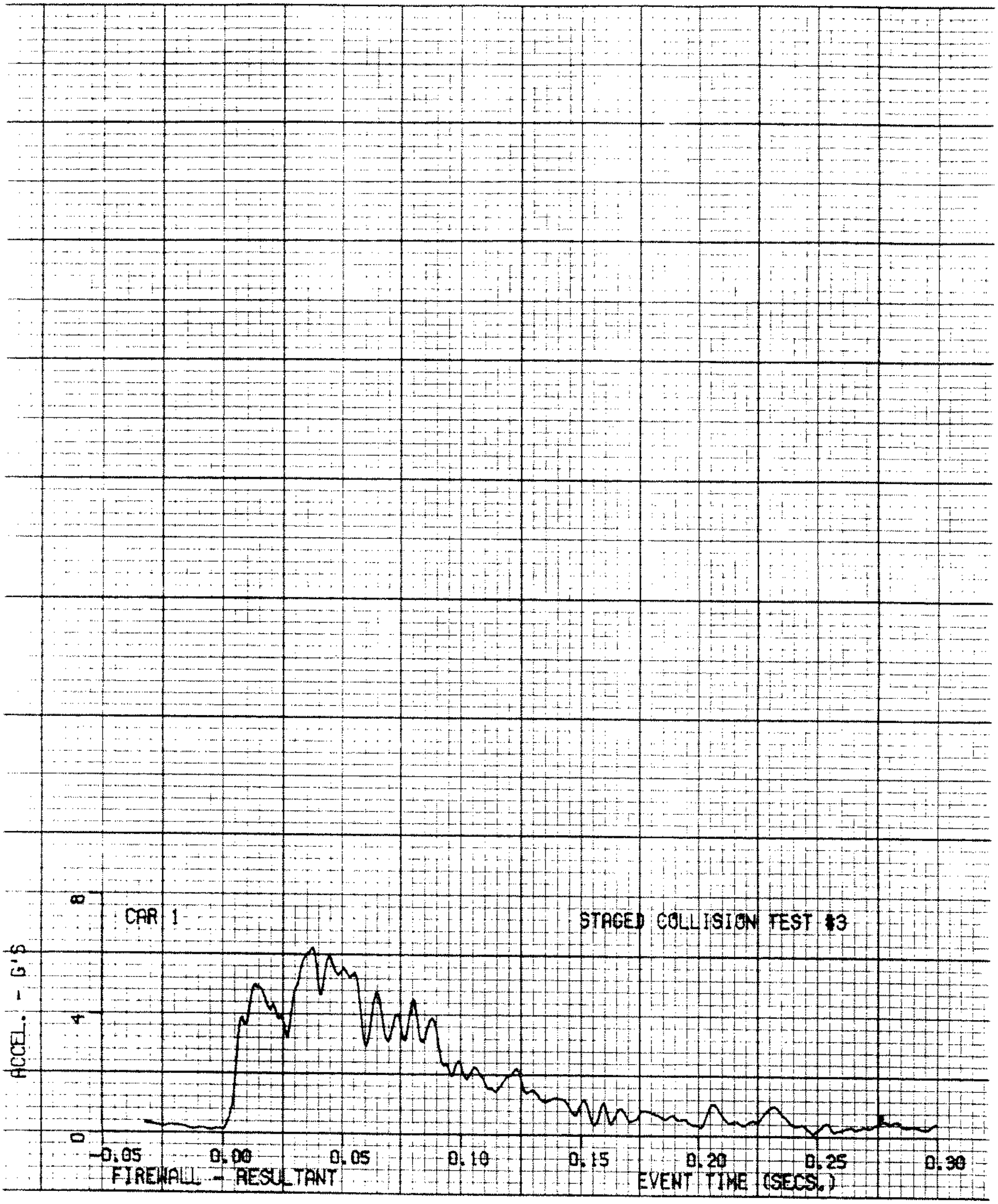
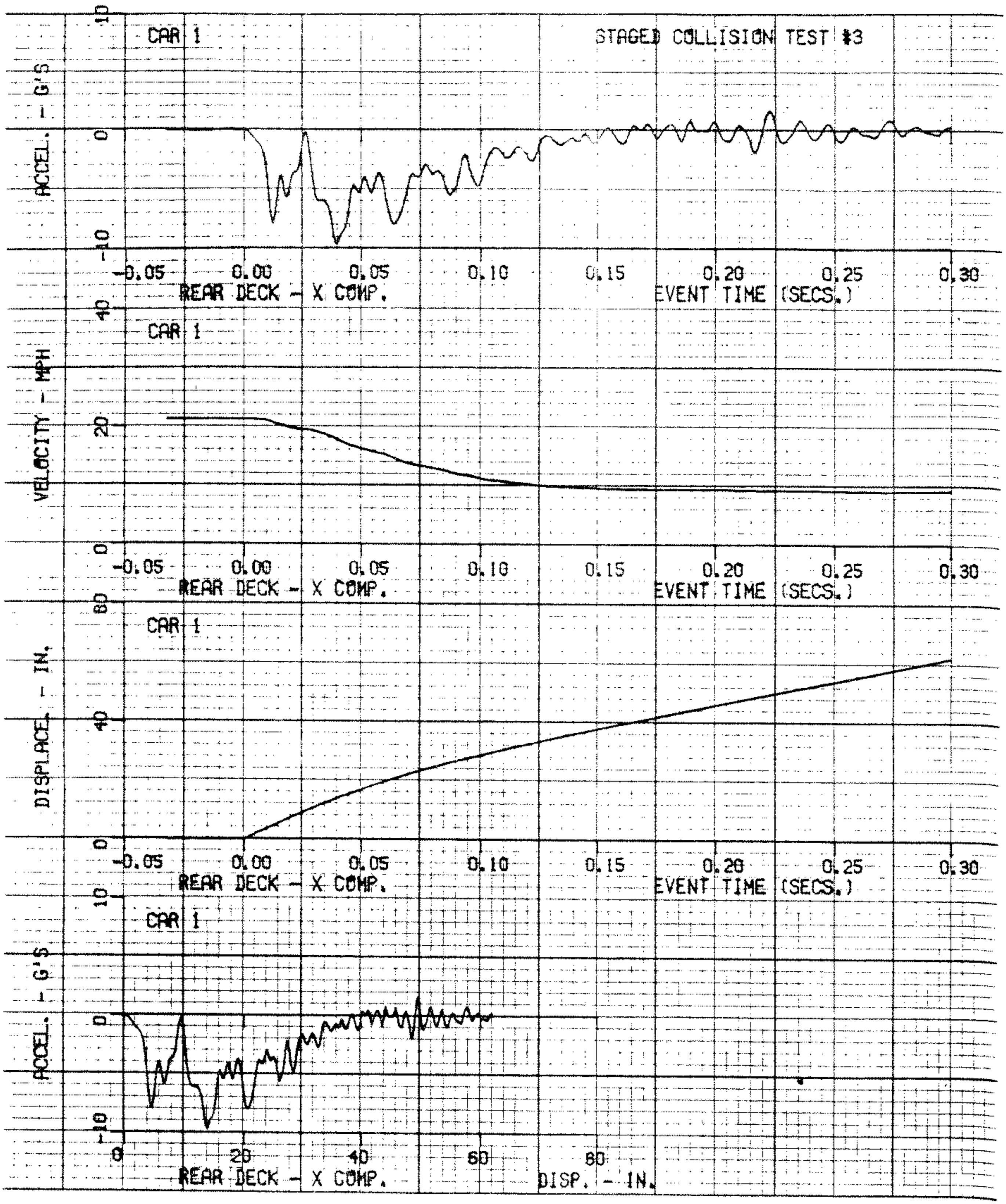
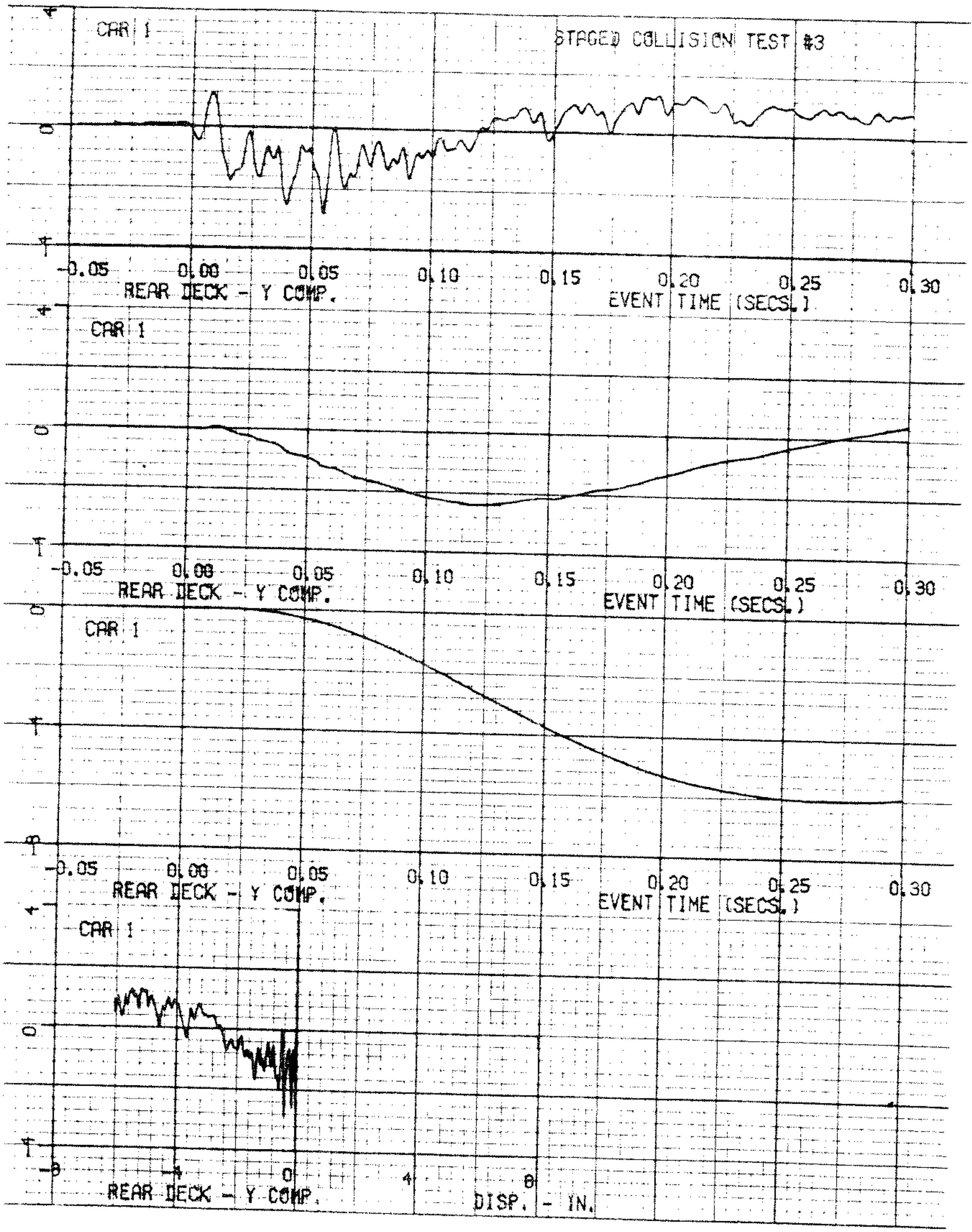
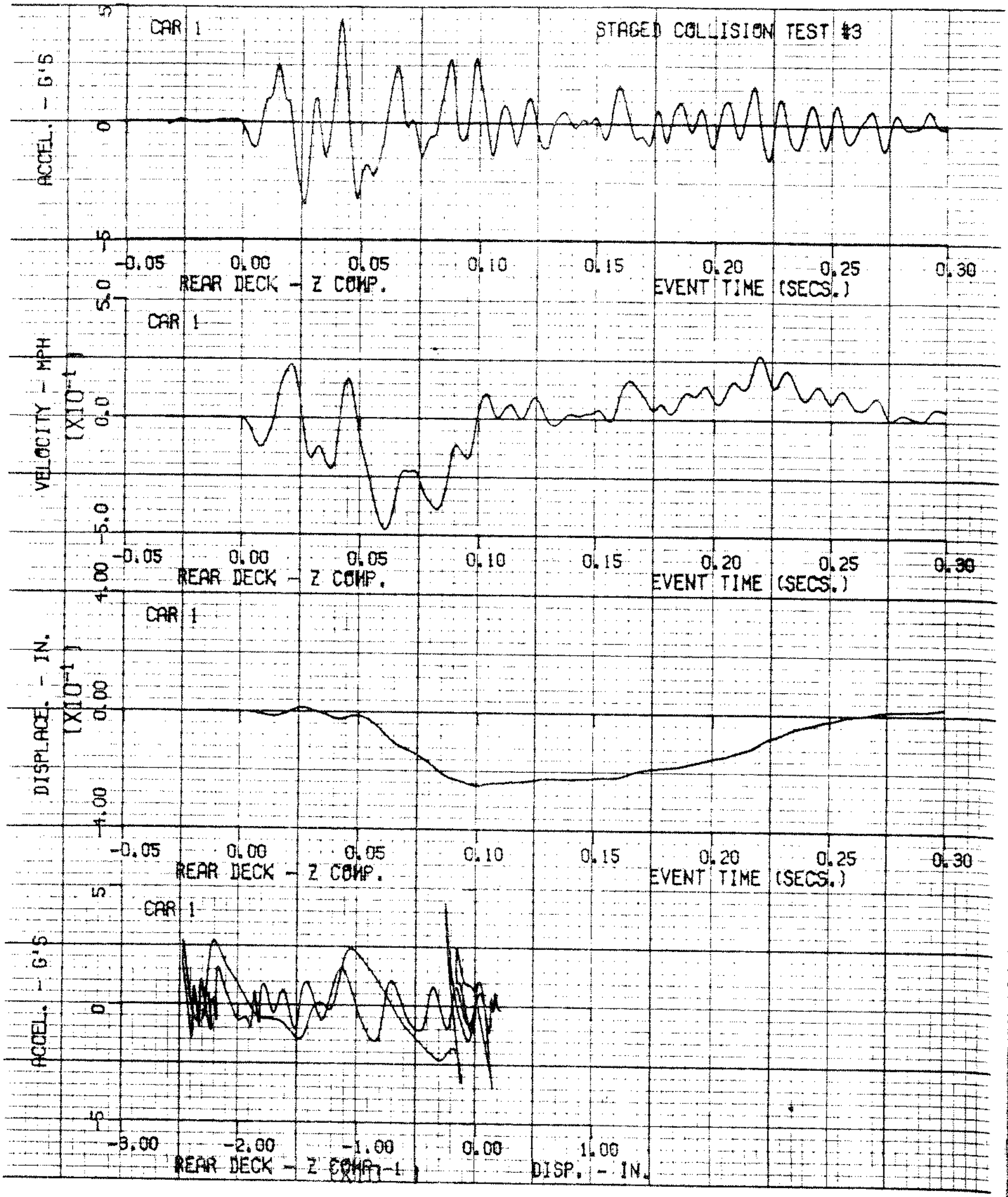

CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
4
0
-4
-3
-2
-1
0
1
FIREWALL - Y COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
4
0
-4
-4.00
0.00
4.00
8.00
12.00
FIREWALL - Z COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
8
4
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
20
40
60
80
REAR DECK - X COMP.
DISP. - IN.


CAR 1
STAGED COLLISION TEST #3
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
REAR DECK - Y COMP.
DISP. - IN.


STAGED COLLISION TEST #3
CAR 1
ACCEL. - G'S
REAR DECK - Z COMP.
EVENT TIME (SECS.)
VELOCITY - MPH (X10^-1)
DISPLACE. - IN. (X10^-1)
DISP. - IN.
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
-3.00
-2.00
-1.00
1.00

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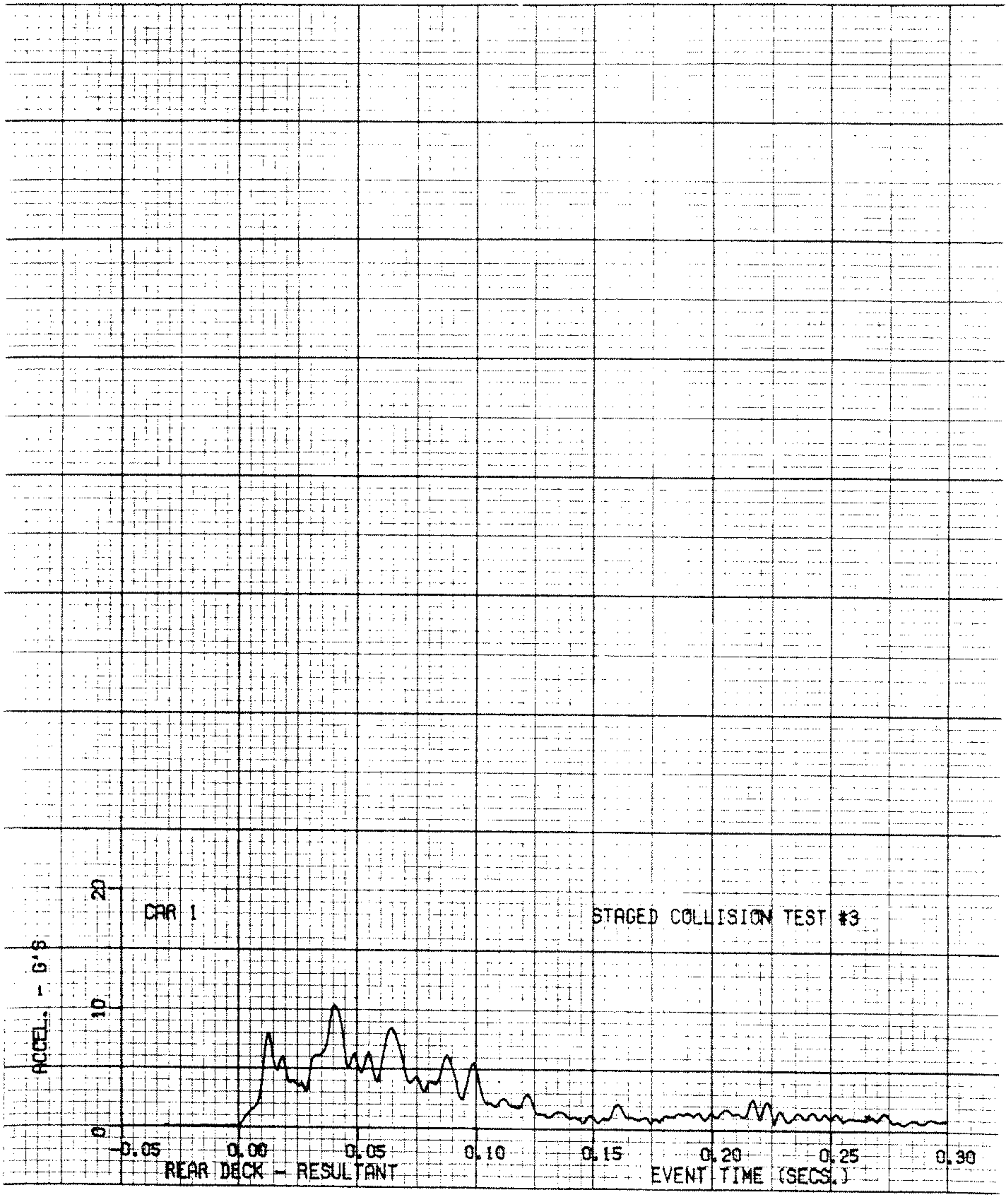
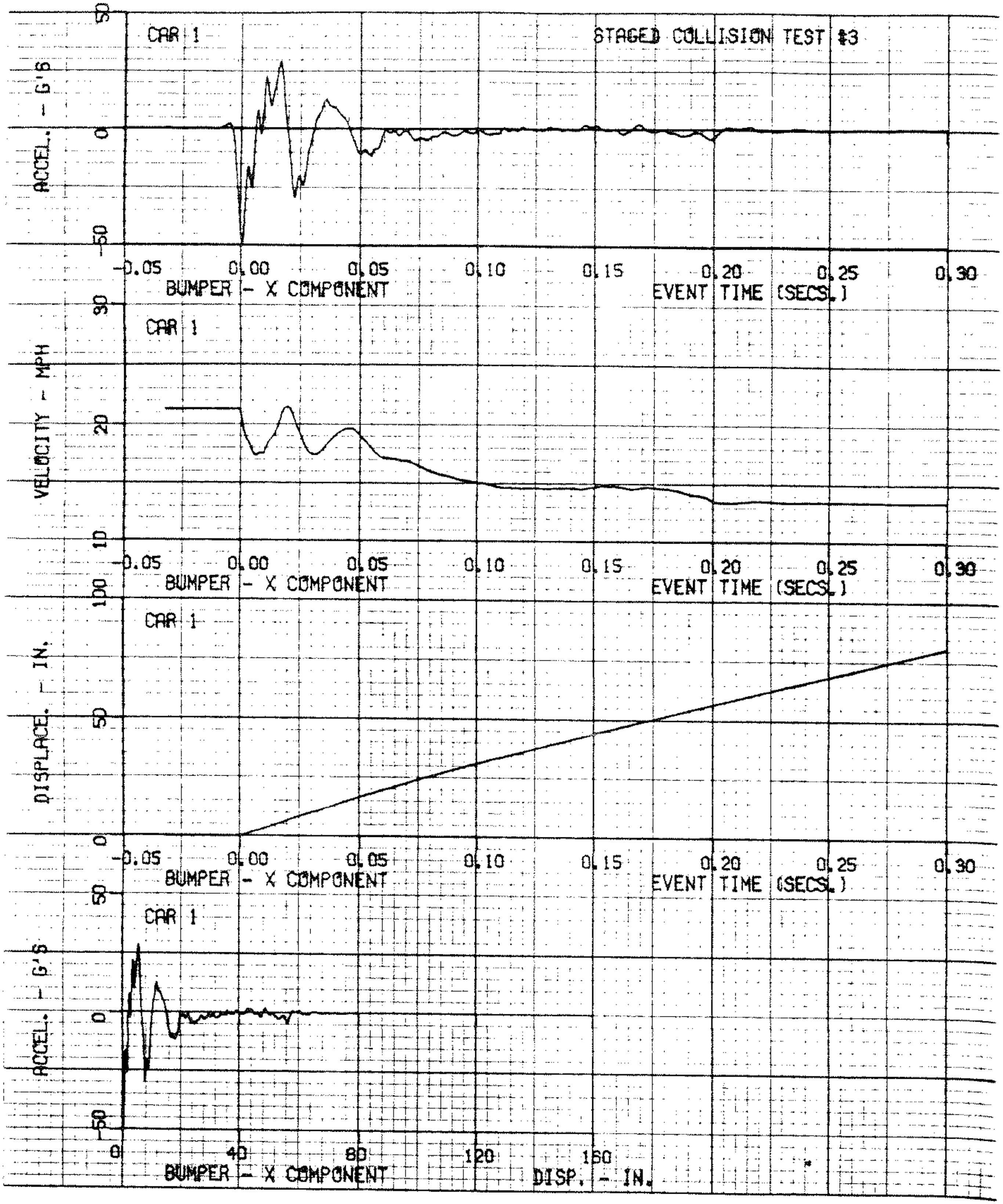

CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED COLLISION TEST #3
ACCEL. - G'S
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
30
20
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
100
50
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
50
0
-50
0
40
80
120
160
BUMPER - X COMPONENT
DISP. - IN.

RICSAC TEST NO. 3

VEHICLE RESPONSES

CAR NO. 2 FORD PINTO

DATA PLOTS

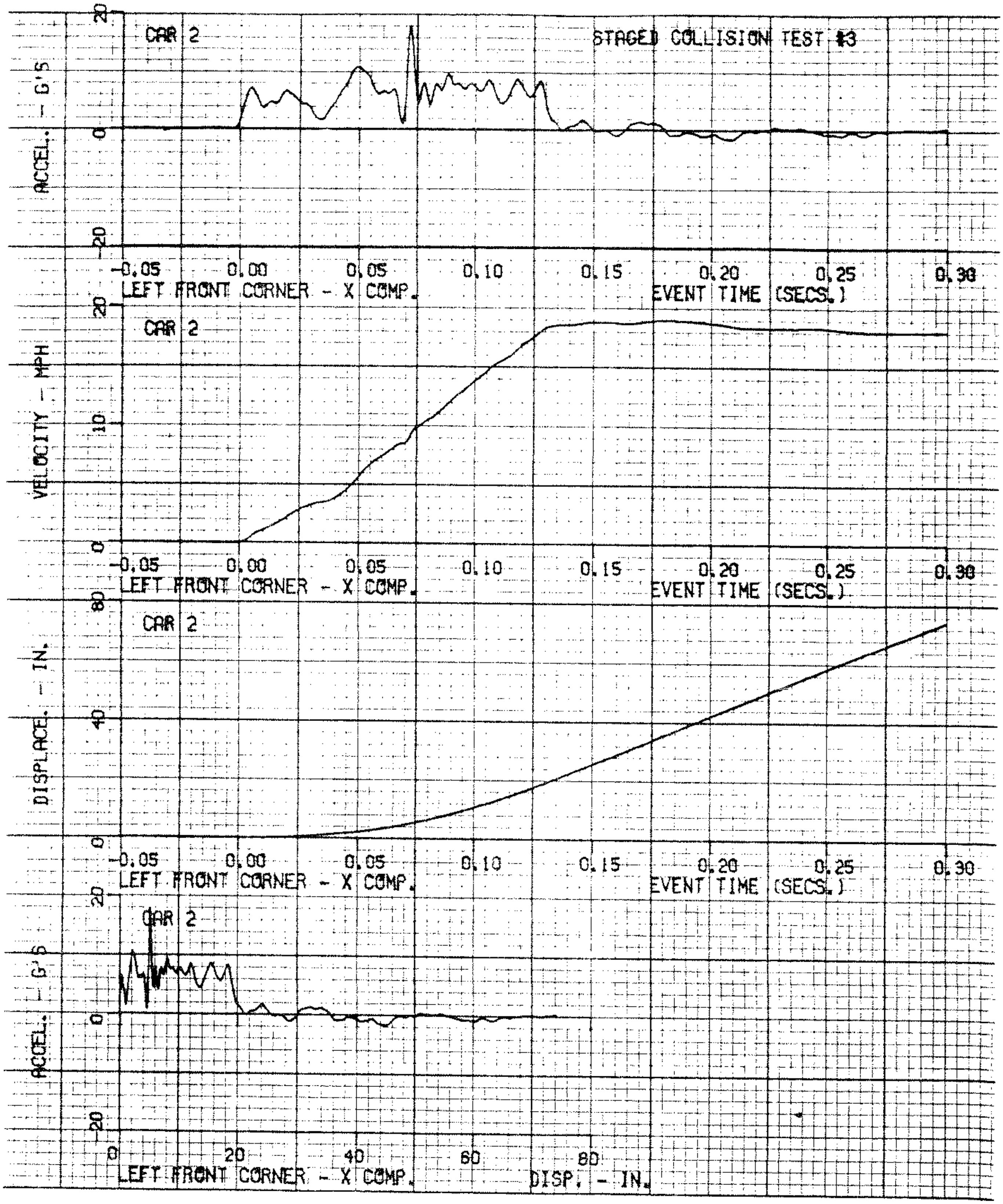
ACCELERATION TIME HISTORIES

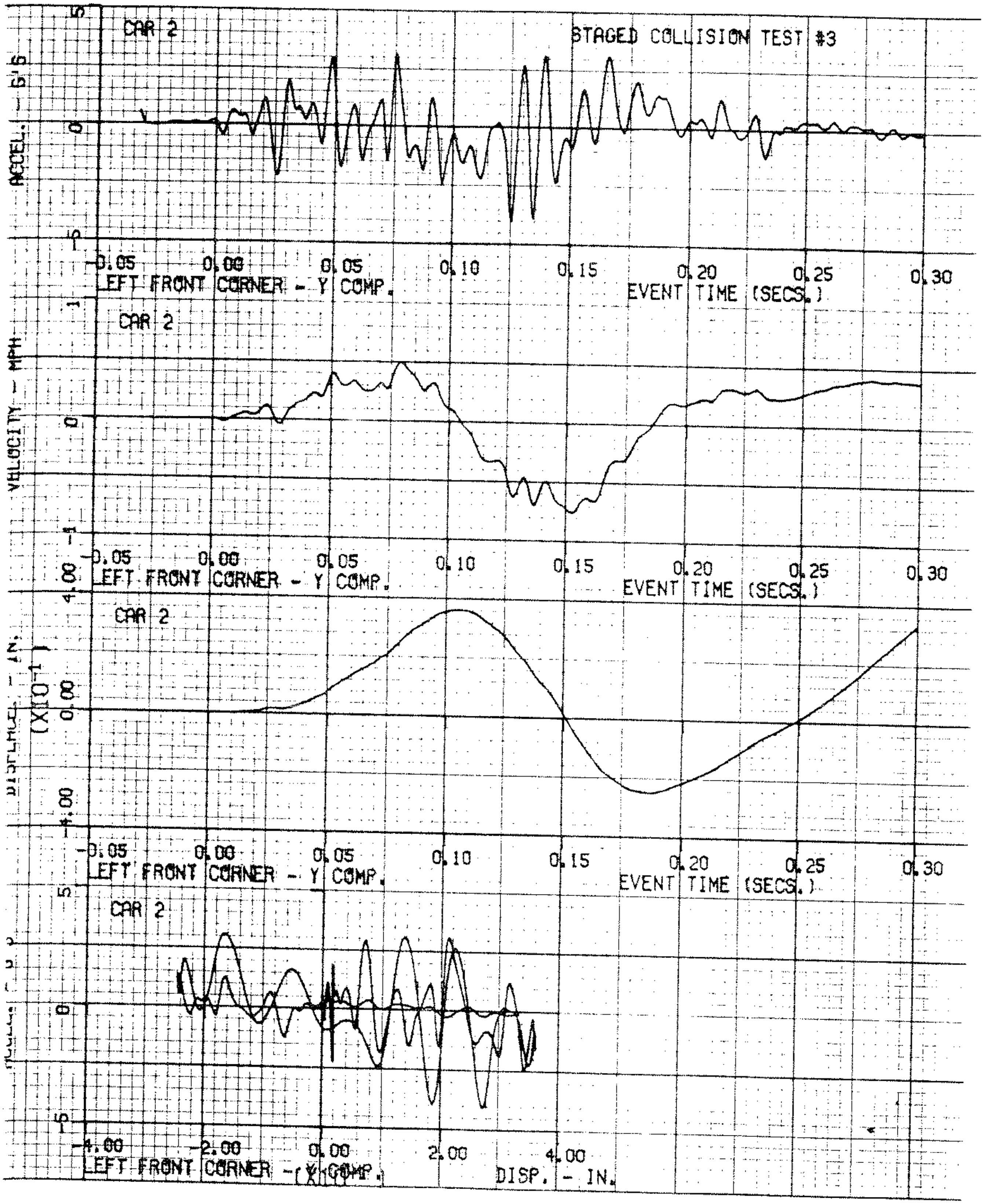
VELOCITY TIME HISTORIES

DISPLACEMENT TIME HISTORIES

ACCELERATION VS DISPLACEMENT

FILTER CLASS 60


STAGED COLLISION TEST #3
CAR 2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
LEFT FRONT CORNER - X COMP.
DISP. - IN.



CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10^-1)
4.00
0.00
-4.00
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
5
0
-5
-4.00
-2.00
0.00
2.00
4.00
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

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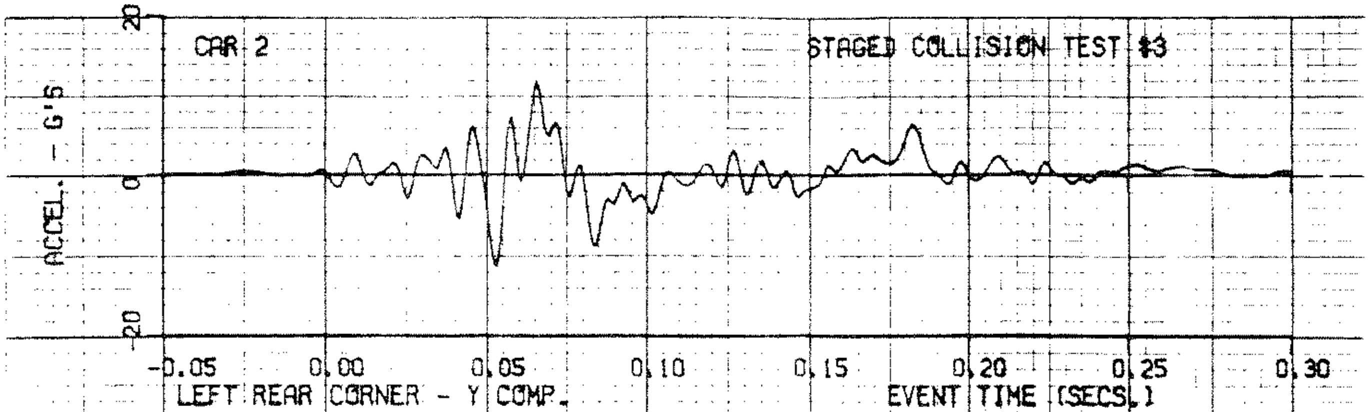
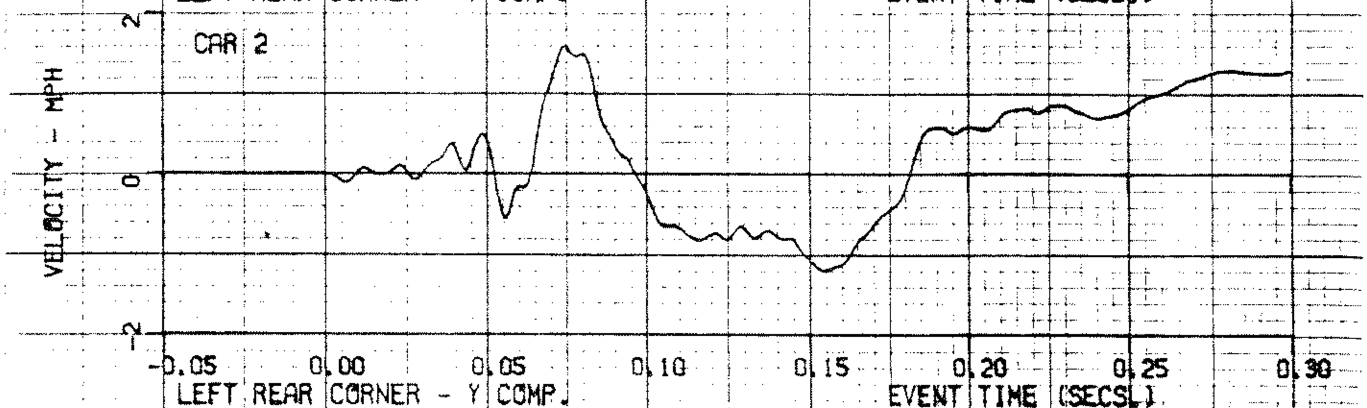
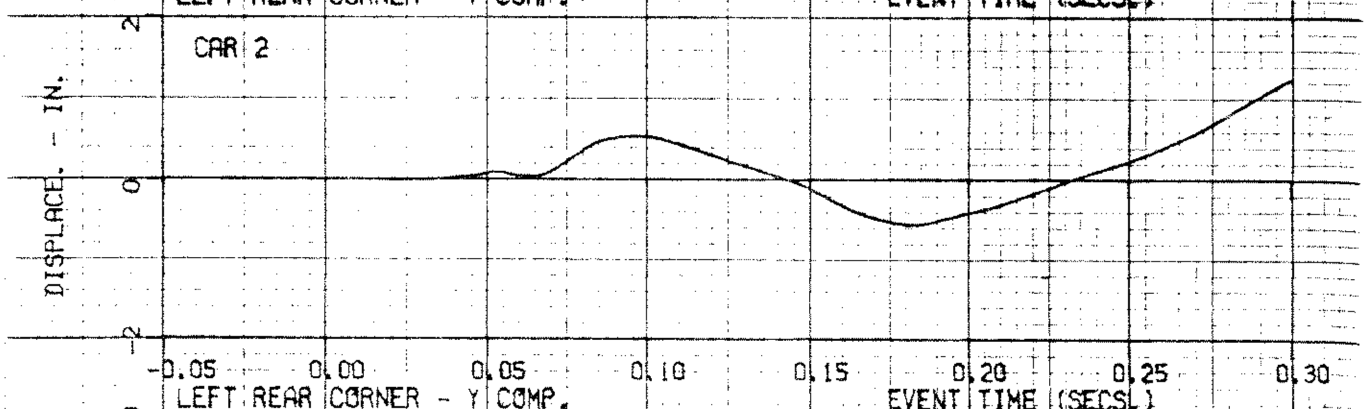
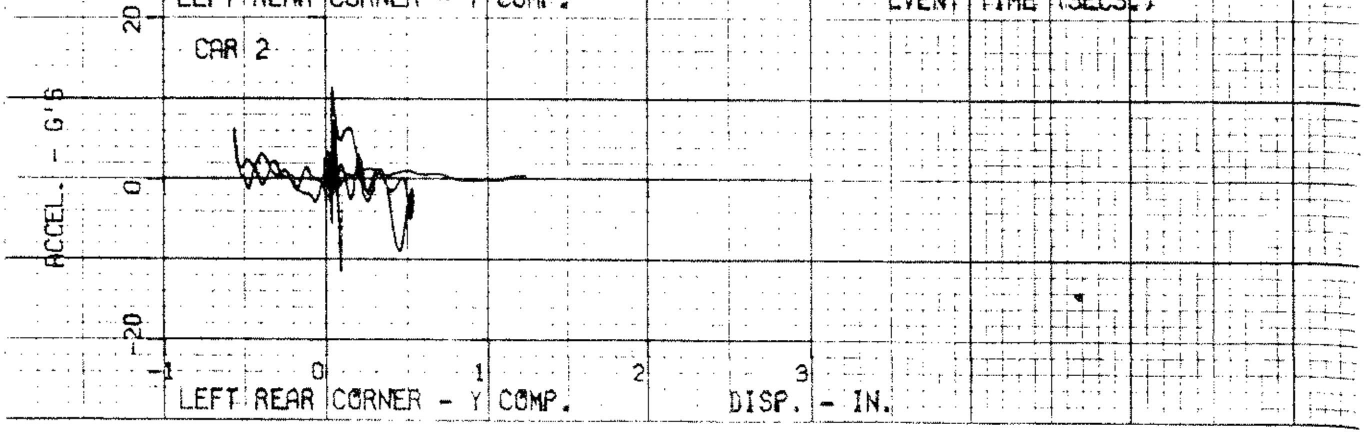
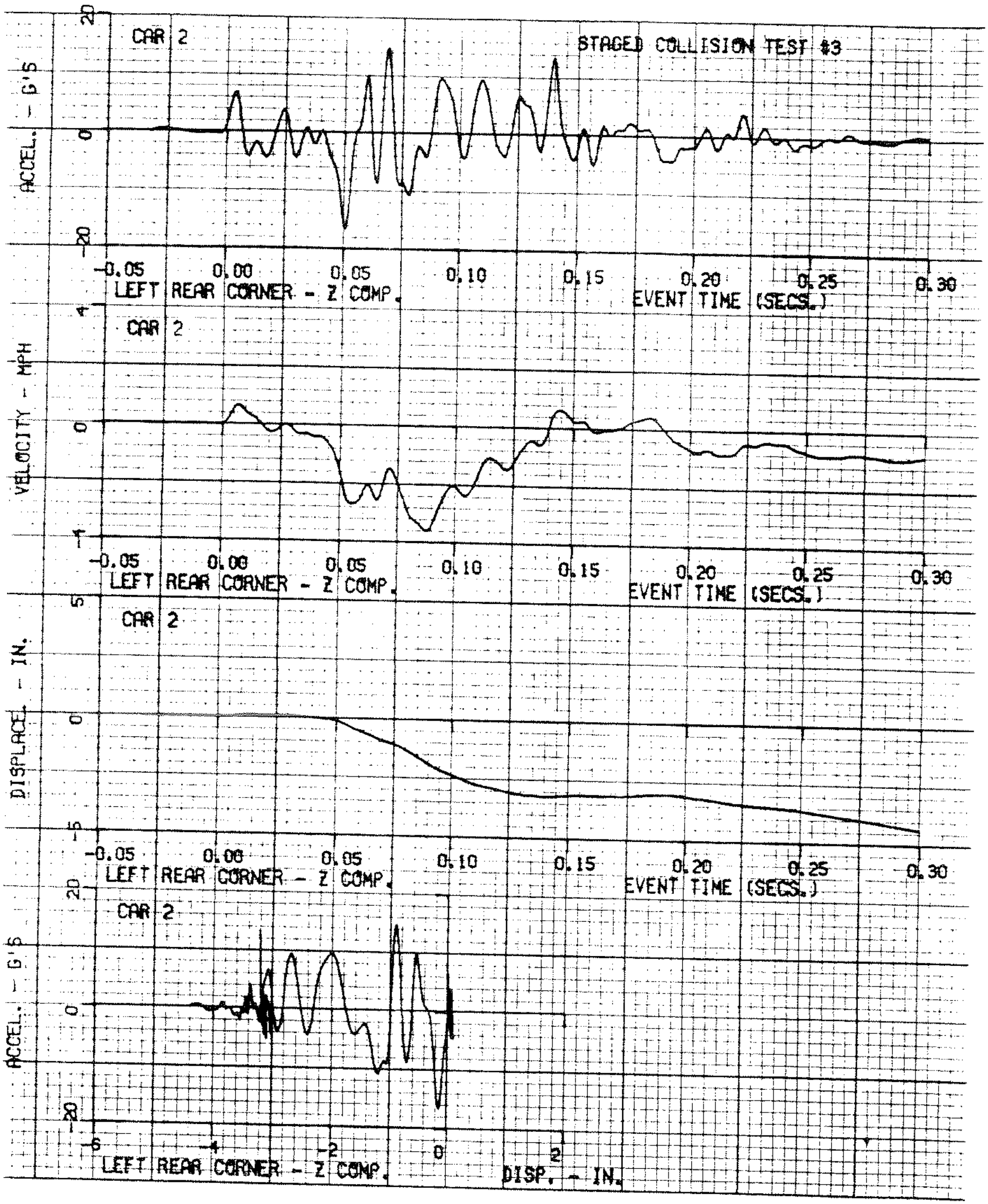
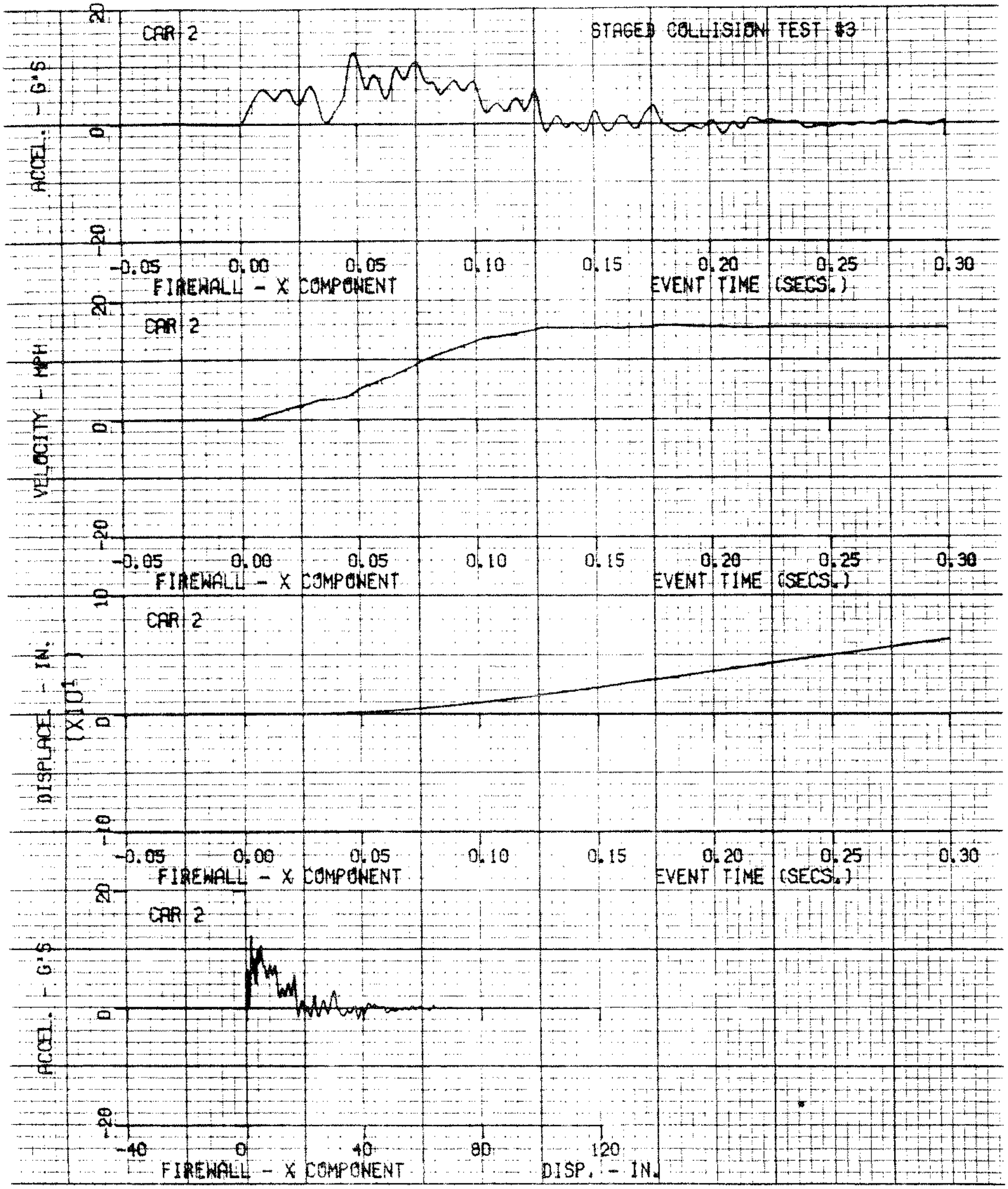

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)


CAR 2
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)


CAR 2
DISPLACE. - IN.
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)


CAR 2
ACCEL. - G'S
20
0
-20
-1
0
1
2
3
LEFT REAR CORNER - Y COMP.
DISP. - IN.


STAGED COLLISION TEST #3
CAR 2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-6
-4
-2
0
2
LEFT REAR CORNER - Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. (X10^1)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-40
0
40
80
120
FIREWALL - X COMPONENT
DISP. - IN.

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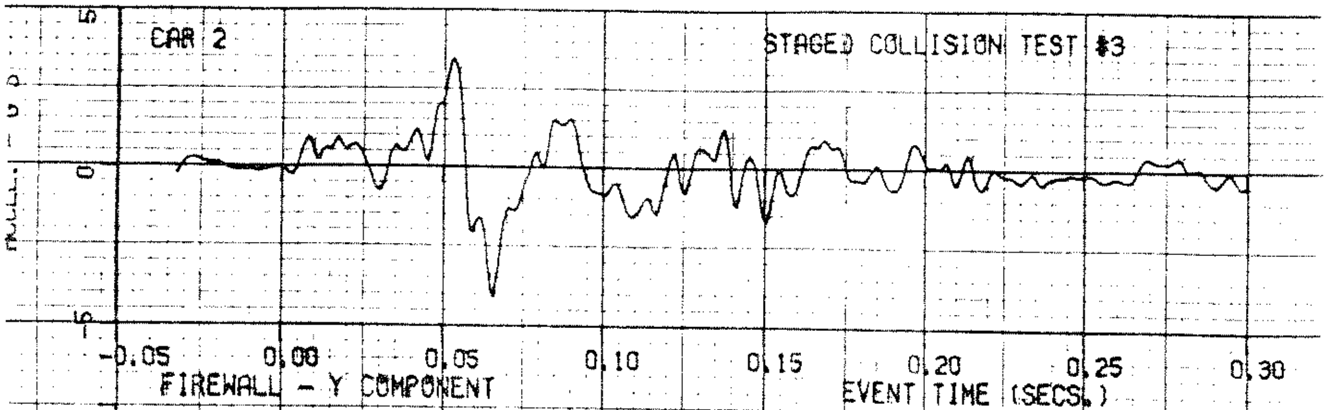
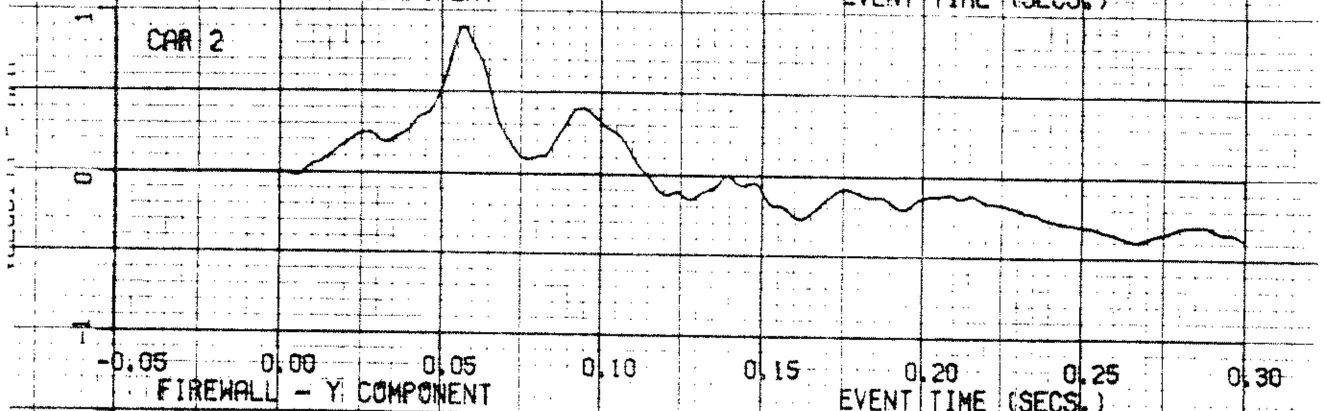
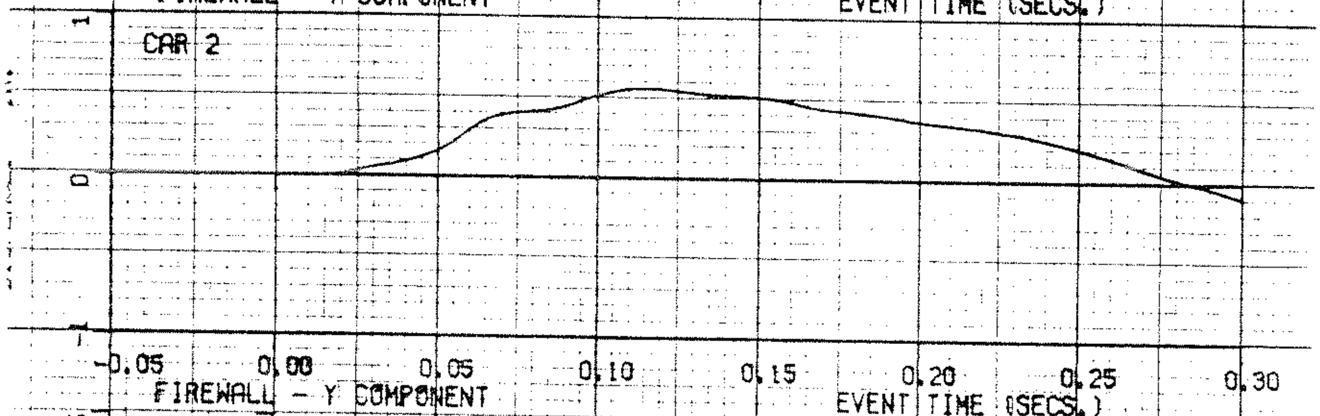
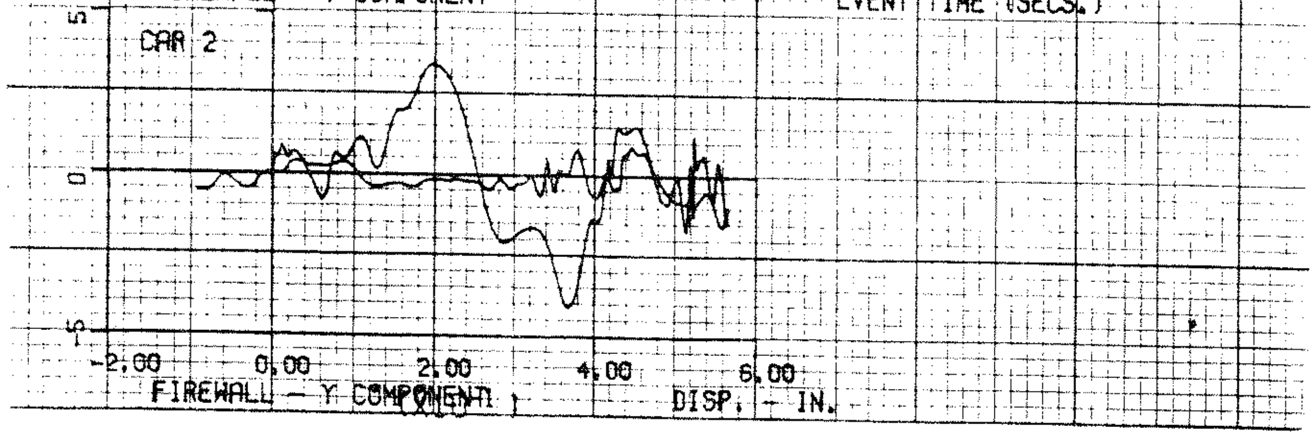

CAR 2
STAGED COLLISION TEST #3
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)


CAR 2
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)


CAR 2
1
0
-1
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)


CAR 2
5
0
-5
-2.00
0.00
2.00
4.00
6.00
FIREWALL - Y COMPONENT
DISP. - IN.

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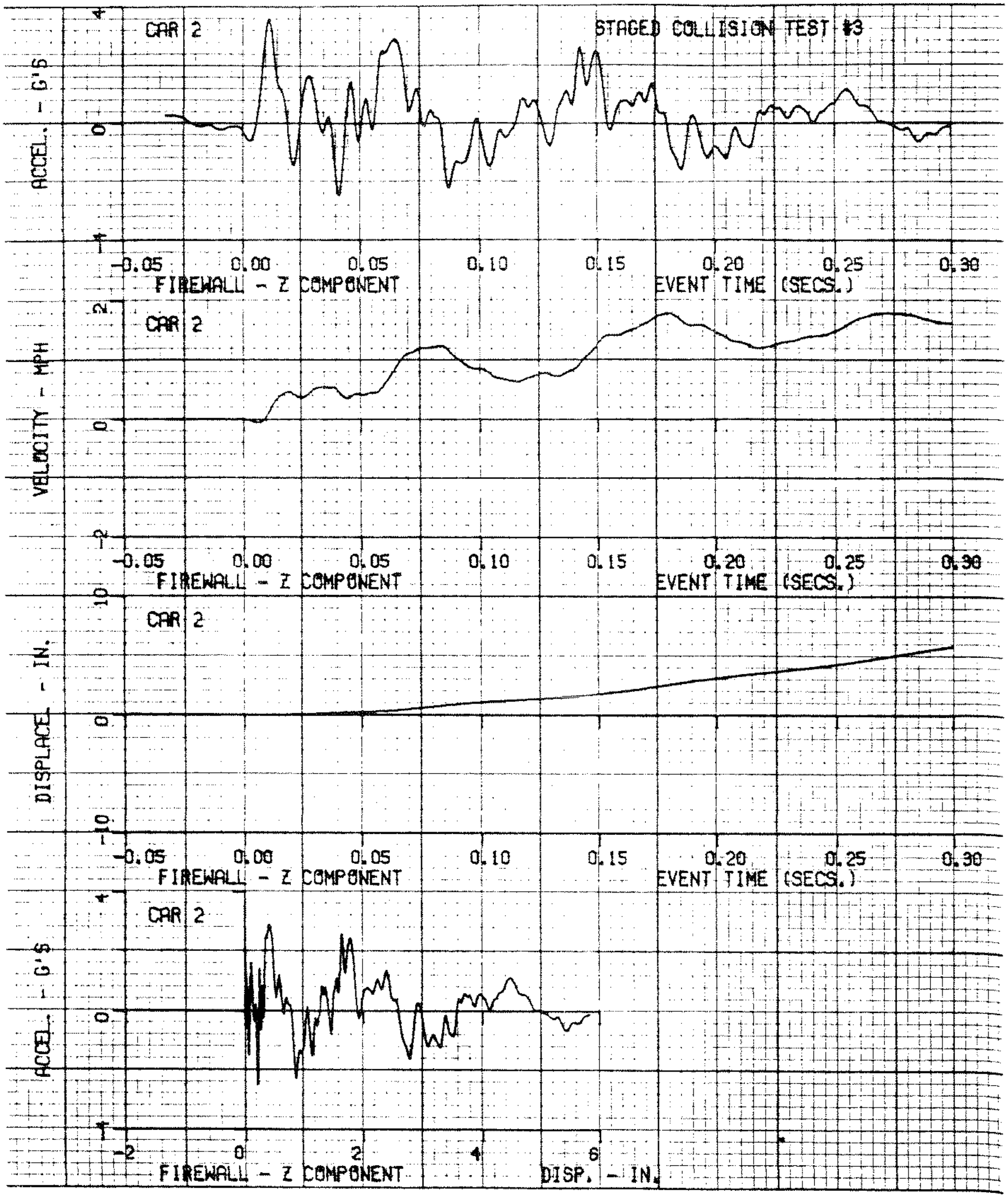
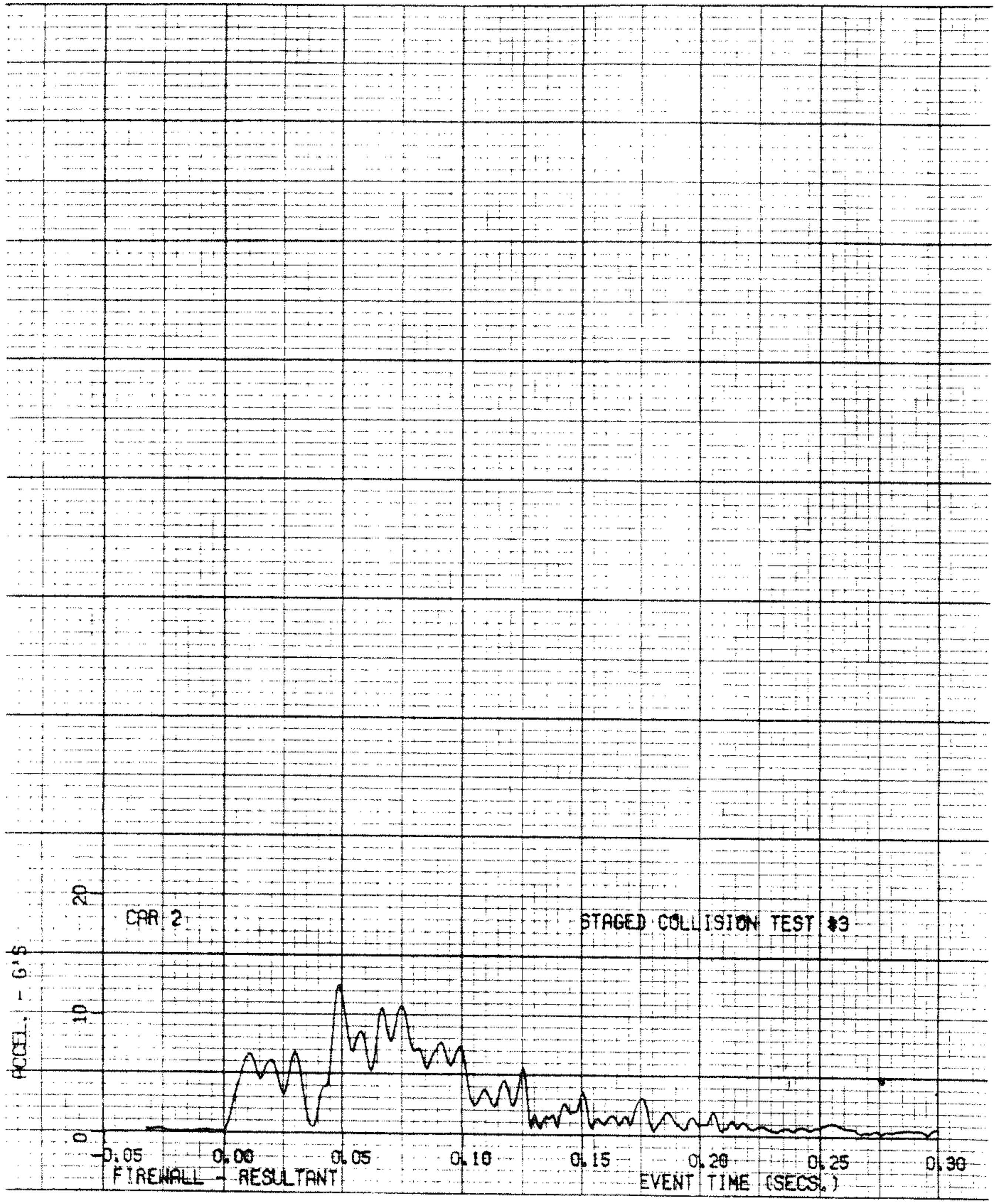
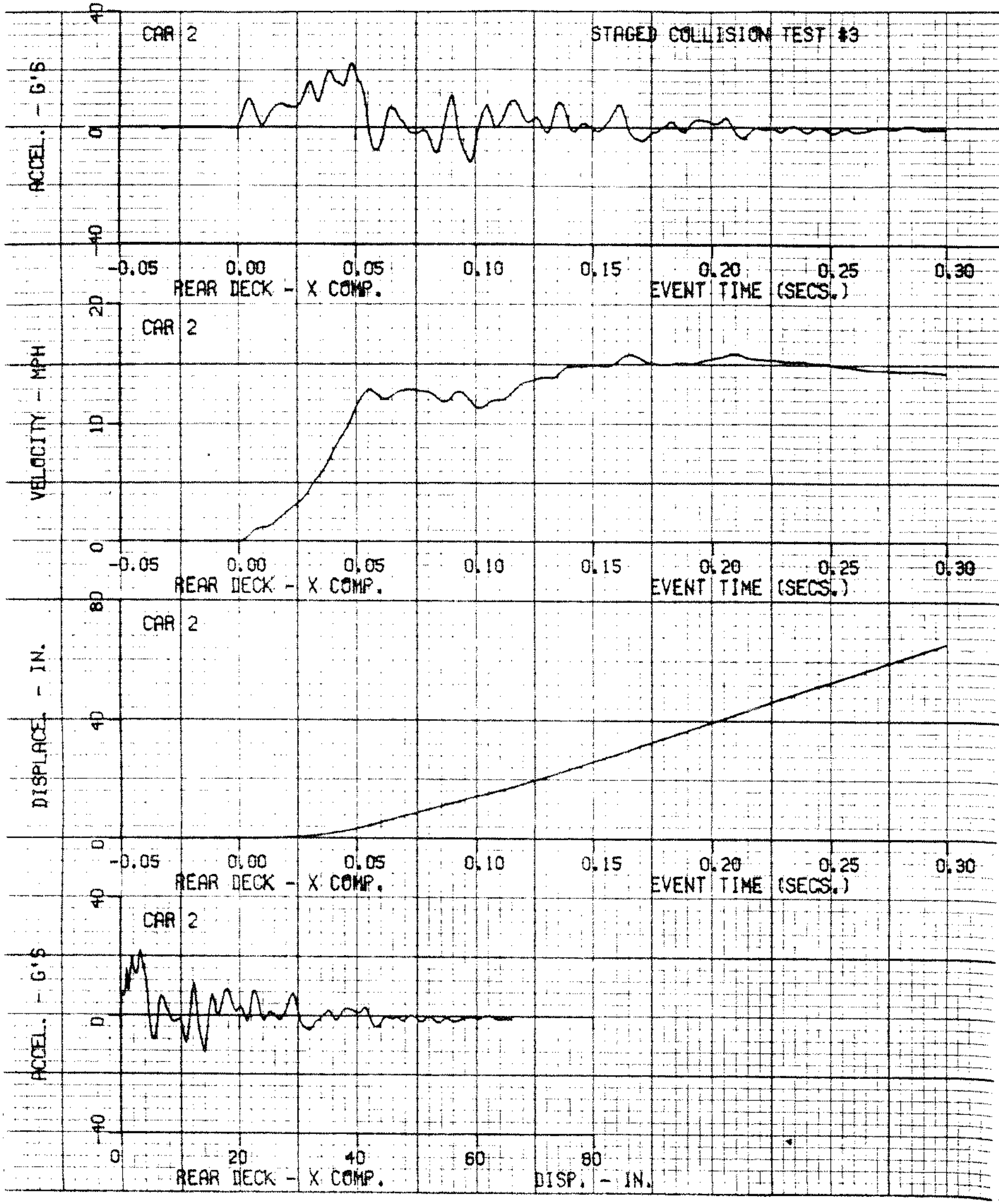

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
-2 0 2 4 6
FIREWALL - Z COMPONENT
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
0
10
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
20
10
0
DISPLACE. - IN.
80
40
0
20
60
DISP. - IN.

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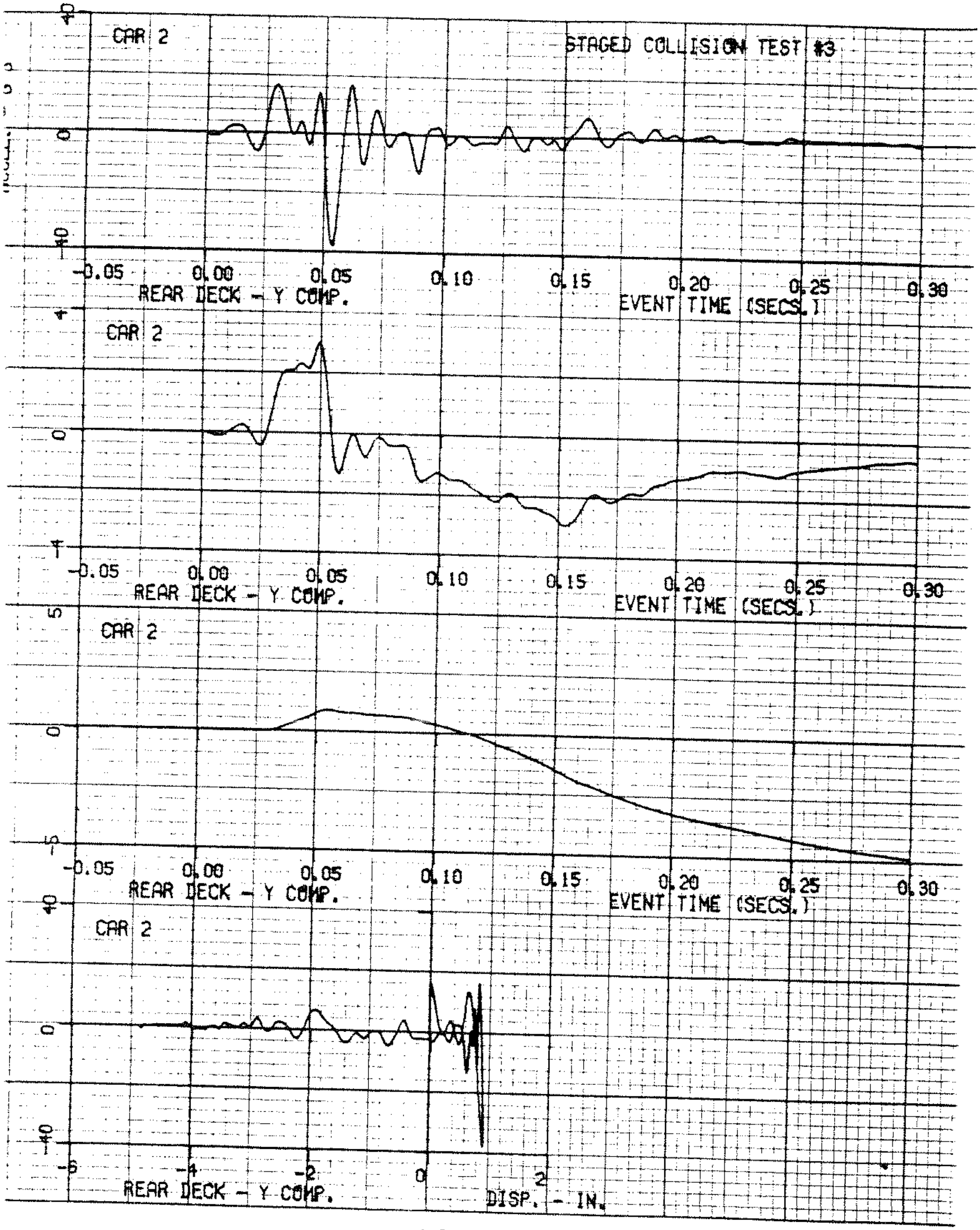
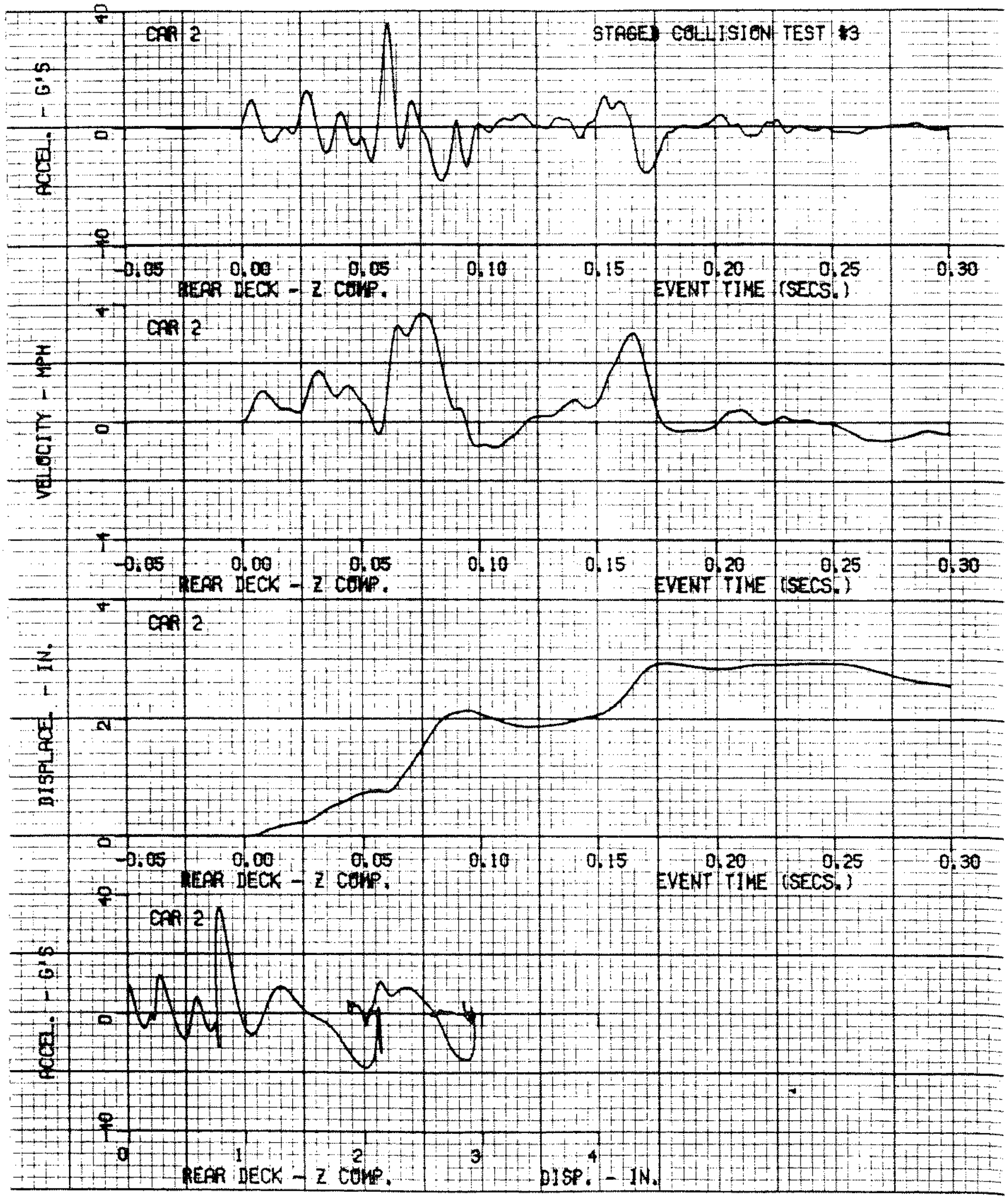

CAR 2
STAGED COLLISION TEST #3
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
40
0
-40
-6
-4
-2
0
2
REAR DECK - Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
4
2
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
1
2
3
4
REAR DECK - Z COMP.
DISP. - IN.

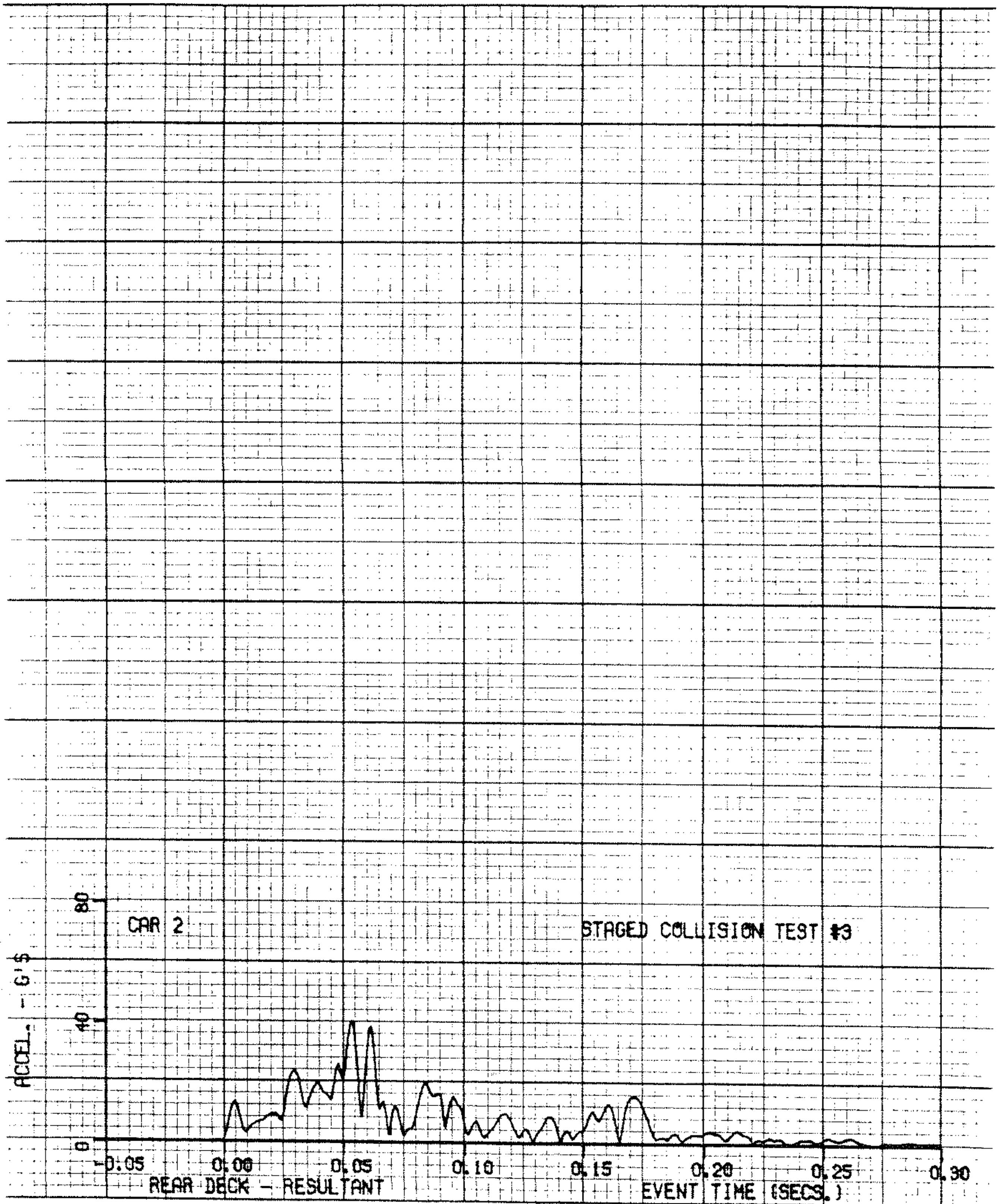

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)

TABLE 9-7

DUMMY INJURY CRITERIA VALUES

CAR 2 - STRUCK VEHICLE - TEST NO. 3

1974 FORD PINTO

	MAXIMUM ACCELERATION ("G") *											
	HEAD				CHEST				PELVIS			
	X	Y	Z	R	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	10	-9	6	12	12	-8.5	6.5	13	12			
DUMMY (2)	17	-3	8	18	12.5	-2.3	4.5	13	10			
DUMMY (3)												
DUMMY (4)												

	MAXIMUM FORCE-FEMUR LOAD (LBS)		DUMMY LOCATION
	RIGHT FEMUR	LEFT FEMUR	
DUMMY (1)	200	200	Left Front Passenger
DUMMY (2)	100	100	Right Front Passenger
DUMMY (3)			
DUMMY (4)			

	MAXIMUM FORCE-SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)			
DUMMY (2)			
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX	
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2	HEAD	CHEST
DUMMY (1)	18.02	.070	.237	6.5	23.9	19.8
DUMMY (2)	32.52	.100	.179	11.1	40.7	21.5
DUMMY (3)						
DUMMY (4)						

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

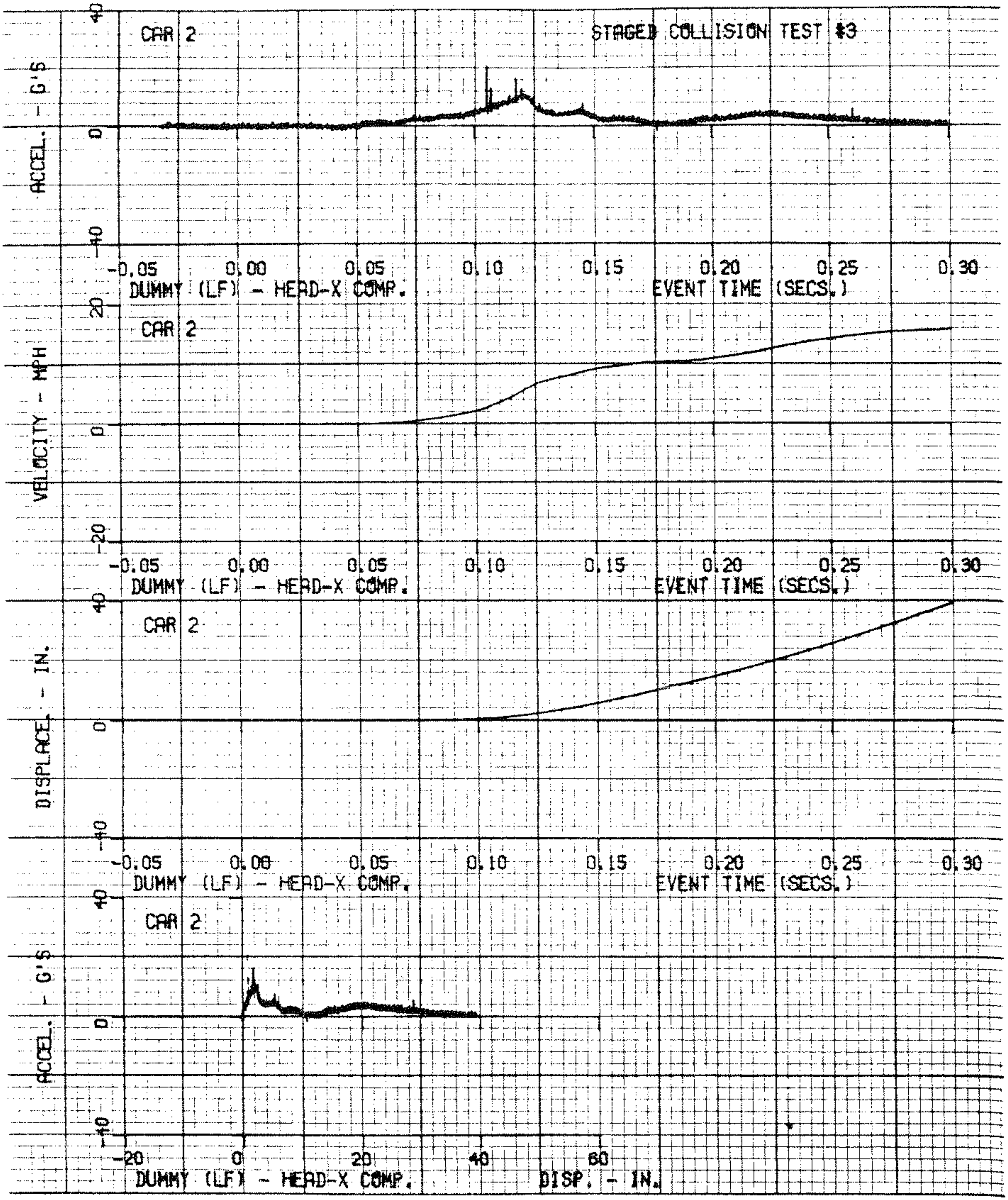
**AS DEFINED IN FMVSS NO. 208

RICSAC TEST NO. 3

DUMMY DATA

CAR NO. 2 PINTO

DATA PLOTS		FILTER CLASS
HEAD ACCELERATION	X,Y,X	1000
HEAD RESULTANT		
HEAD SEVERITY INDEX		
CHEST ACCELERATION	X,Y,Z	180
CHEST RESULTANT		
CHEST VELOCITY	X,Y,Z	
CHEST DISPLACEMENT	X,Y,Z	
CHEST SEVERITY INDEX		
PELVIC ACCELERATION	X	180
PELVIC VELOCITY	X	
PELVIC DISPLACEMENT	X	
FEMUR LOADS	L & R	600


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-20
0
20
40
60
DUMMY (LF) - HEAD-X COMP.
DISP. - IN.

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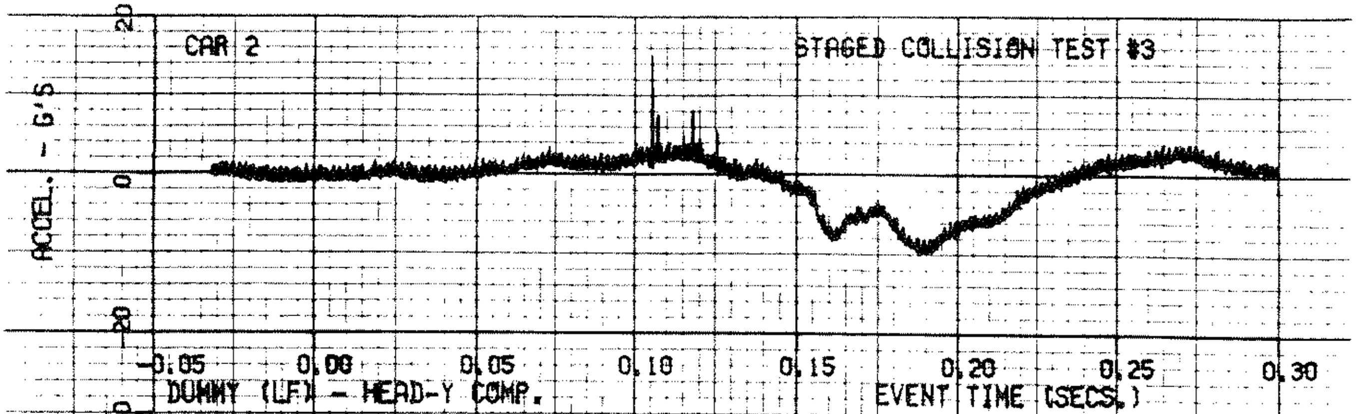
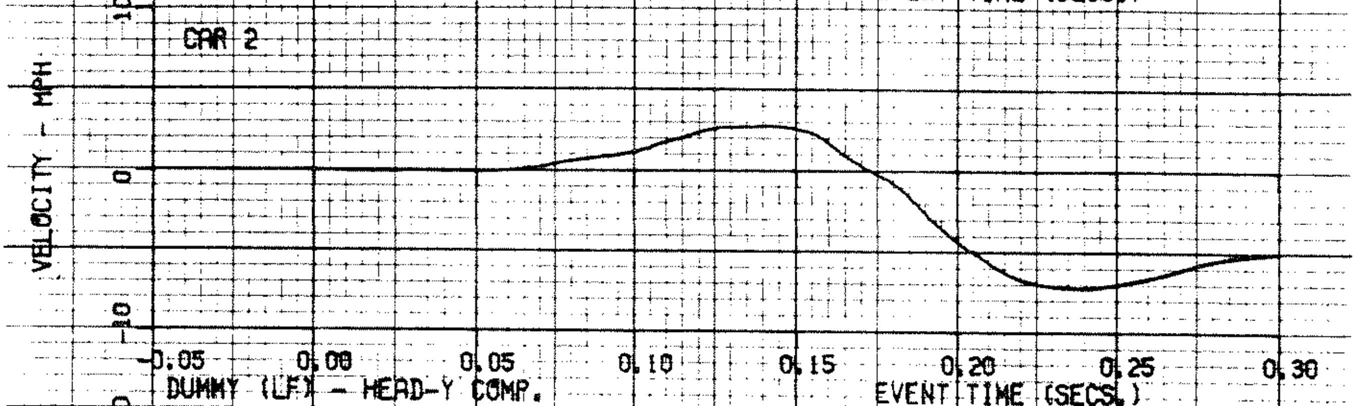
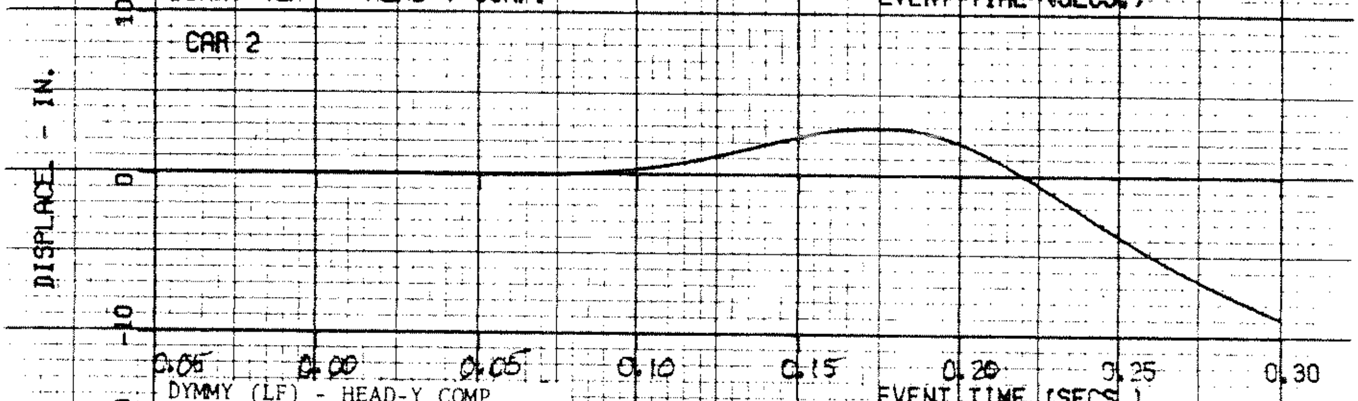
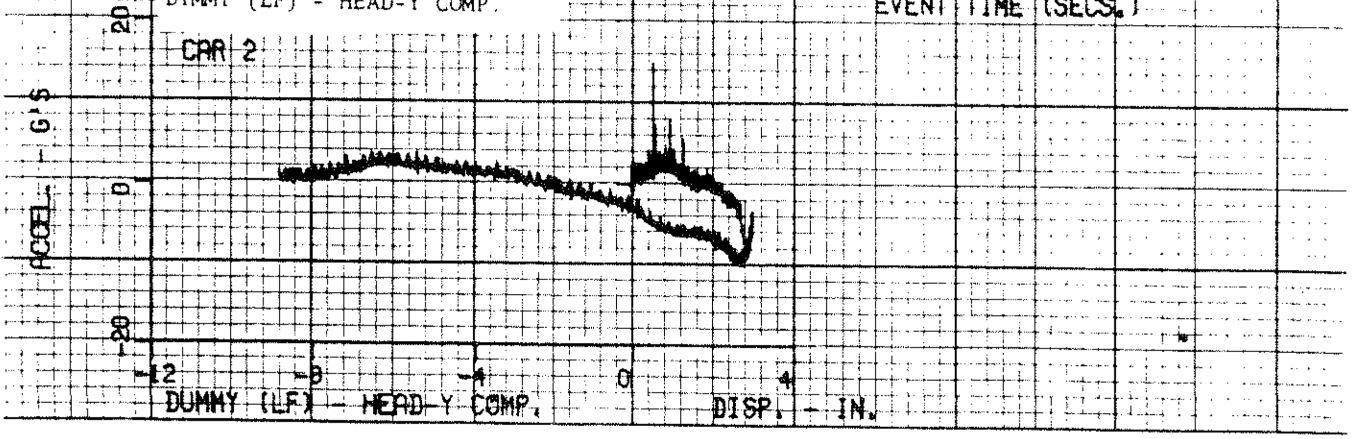
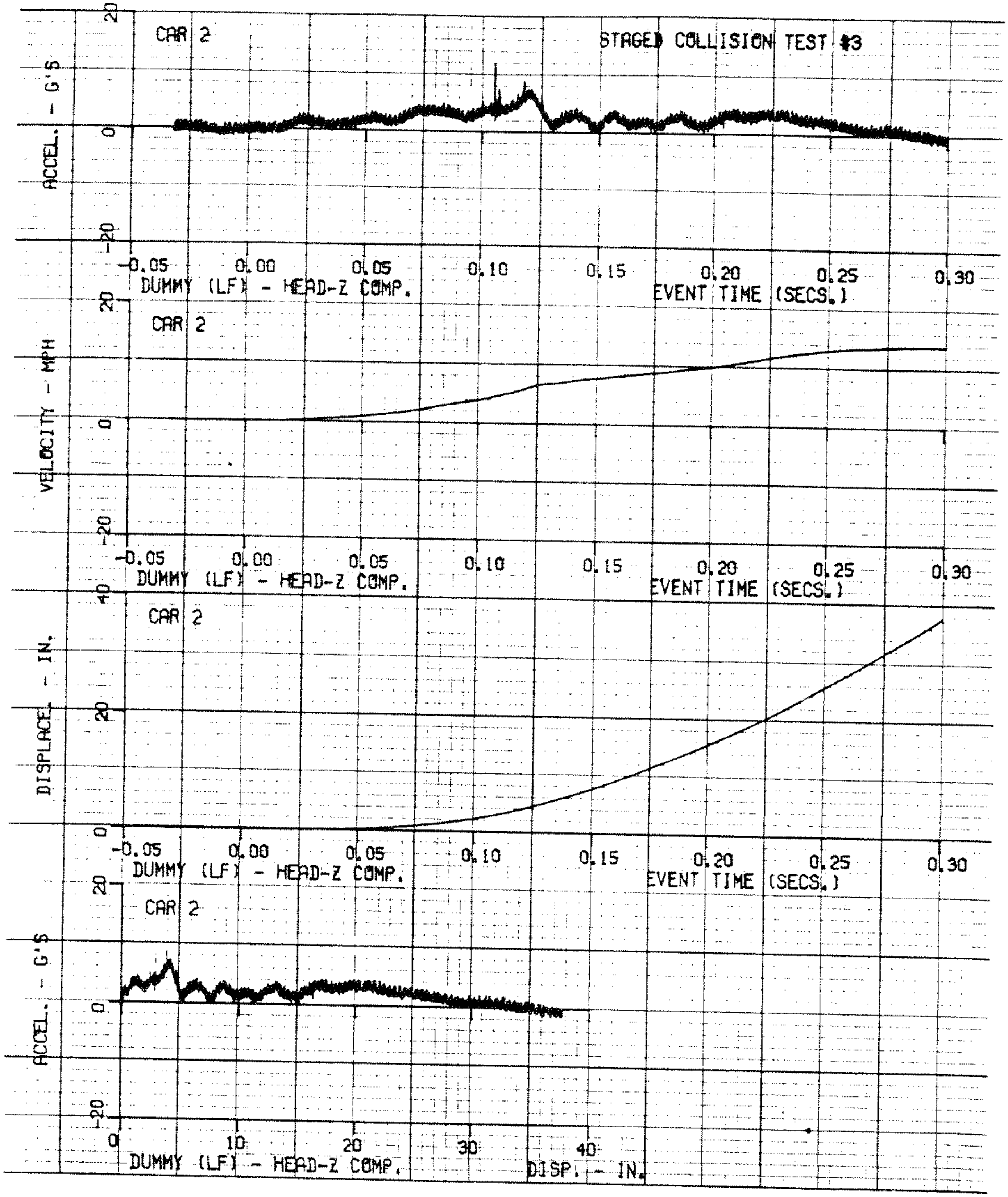
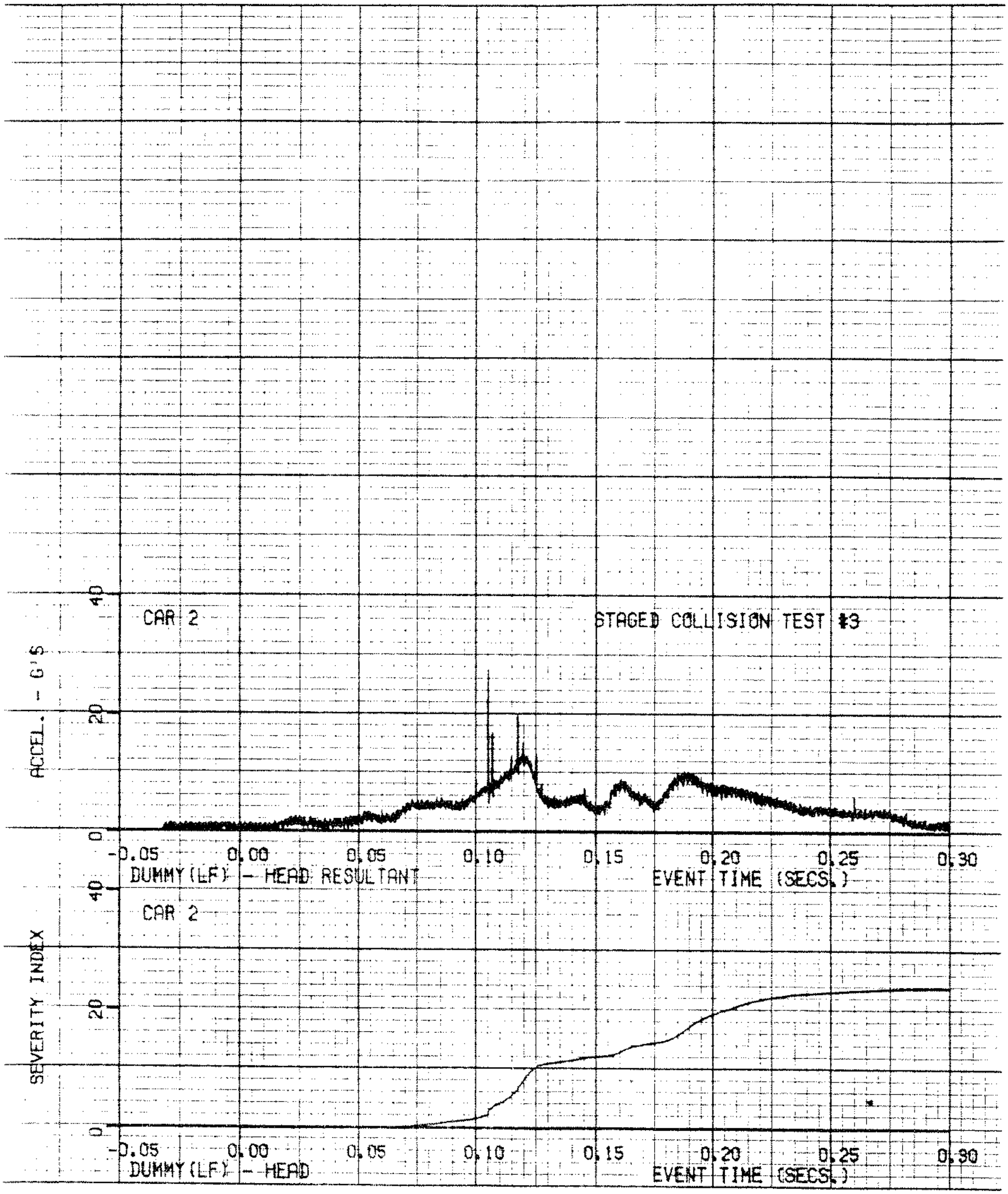

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)

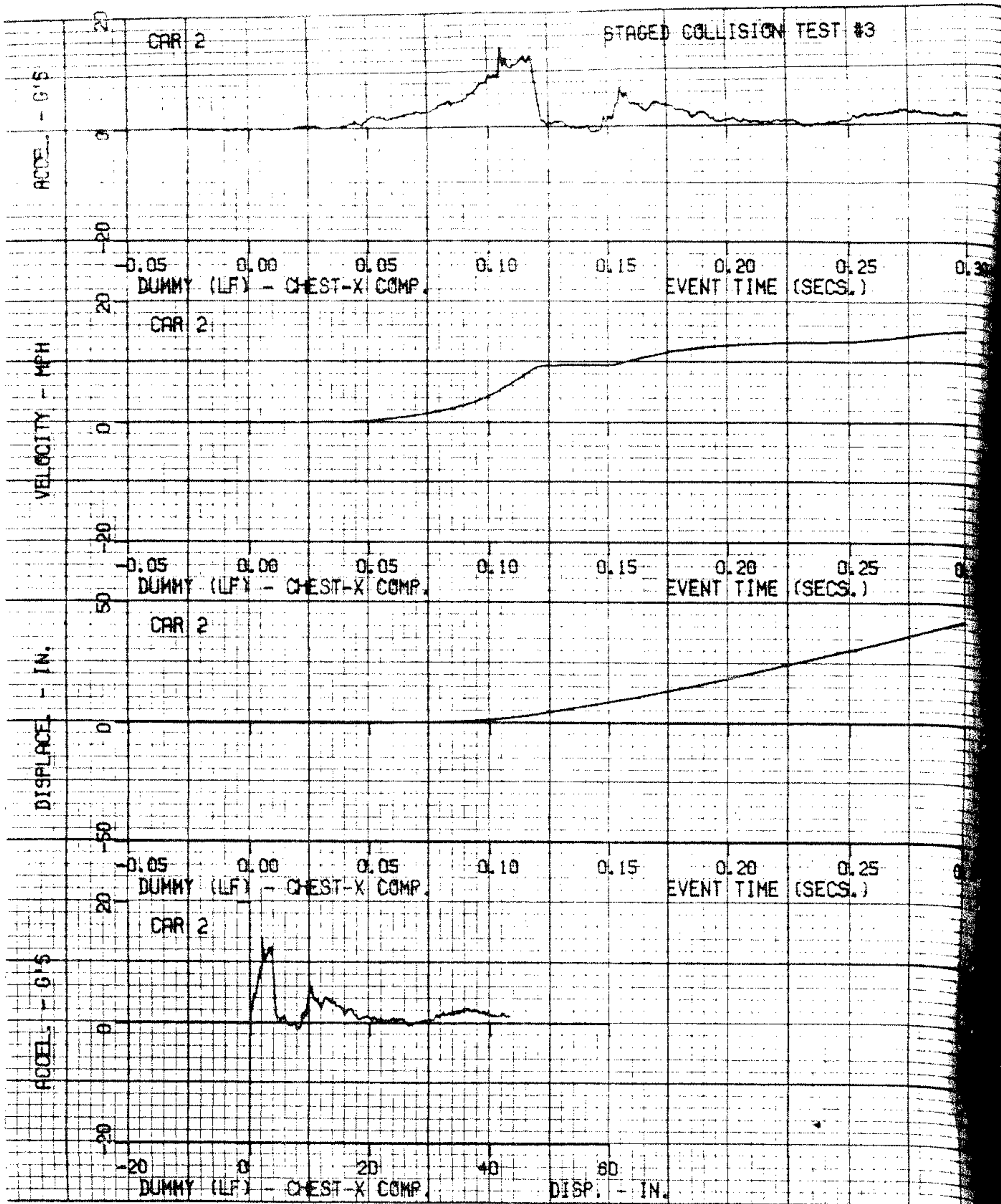

CAR 2
VELOCITY - MPH
10
0
-10
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)

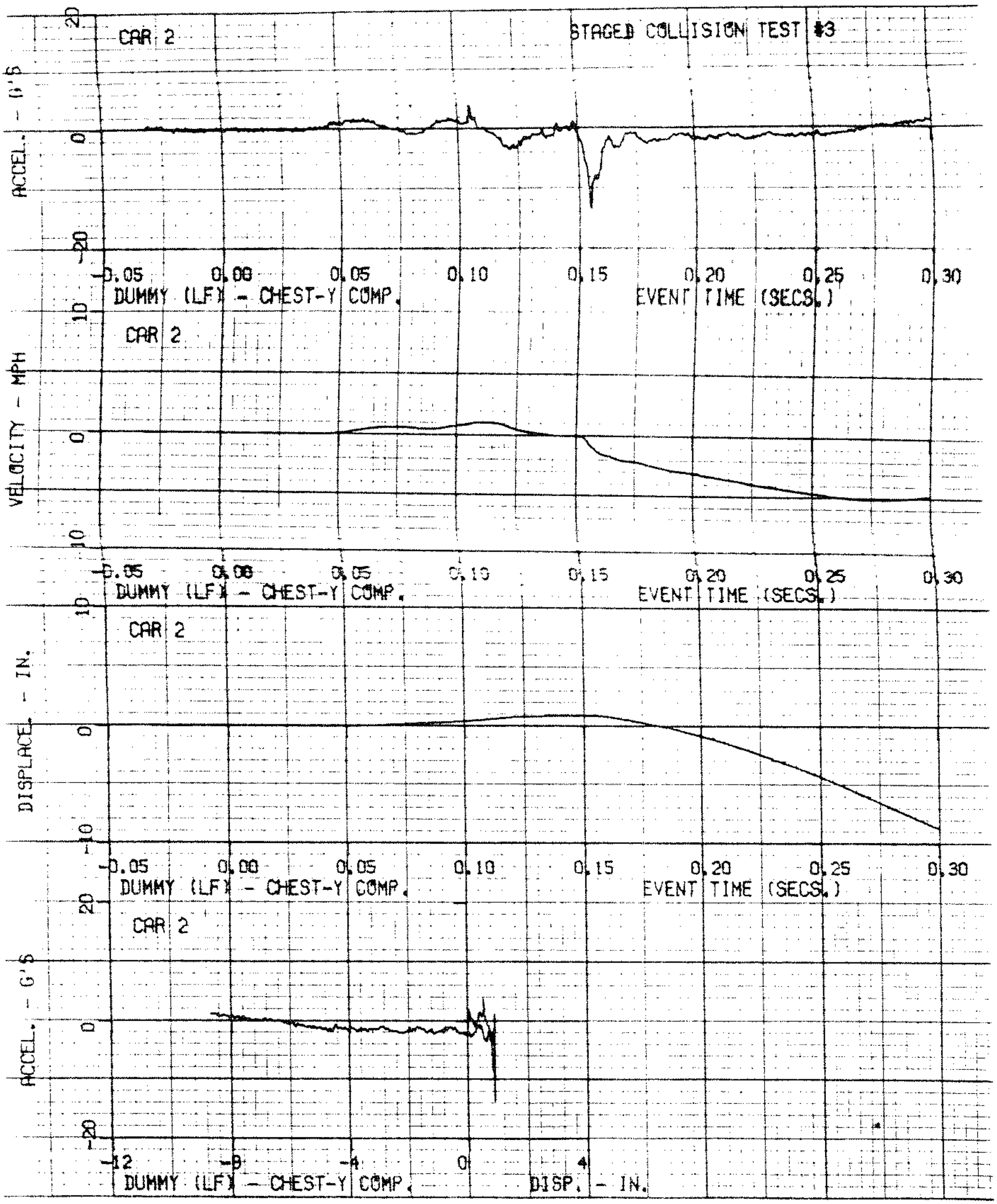

CAR 2
DISPLACE. - IN.
10
0
-10
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DYMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)

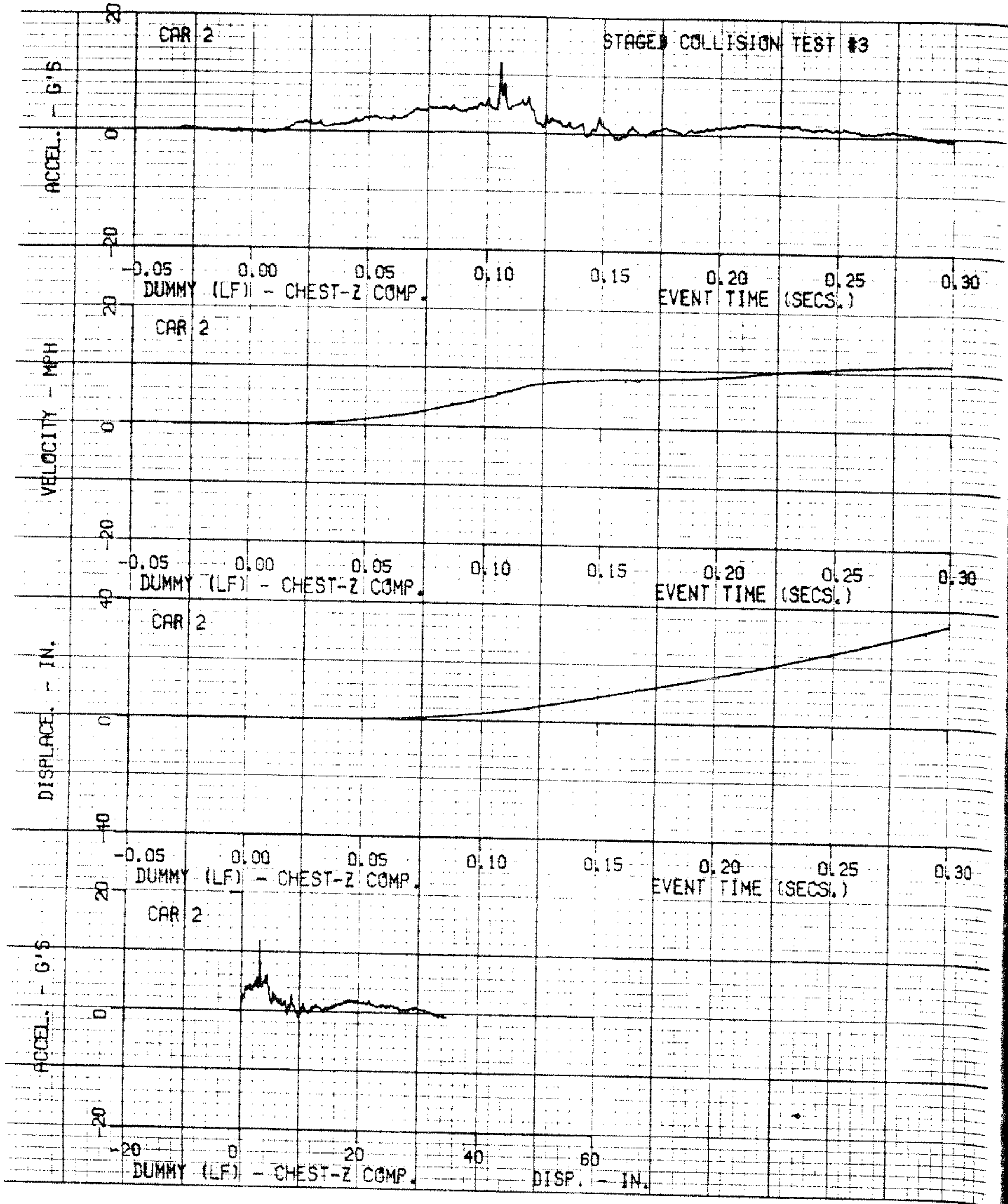

CAR 2
ACCEL. - G'S
20
0
-20
-12 -8 -4 0 4
DUMMY (LF) - HEAD-Y COMP.
DISP. - IN.

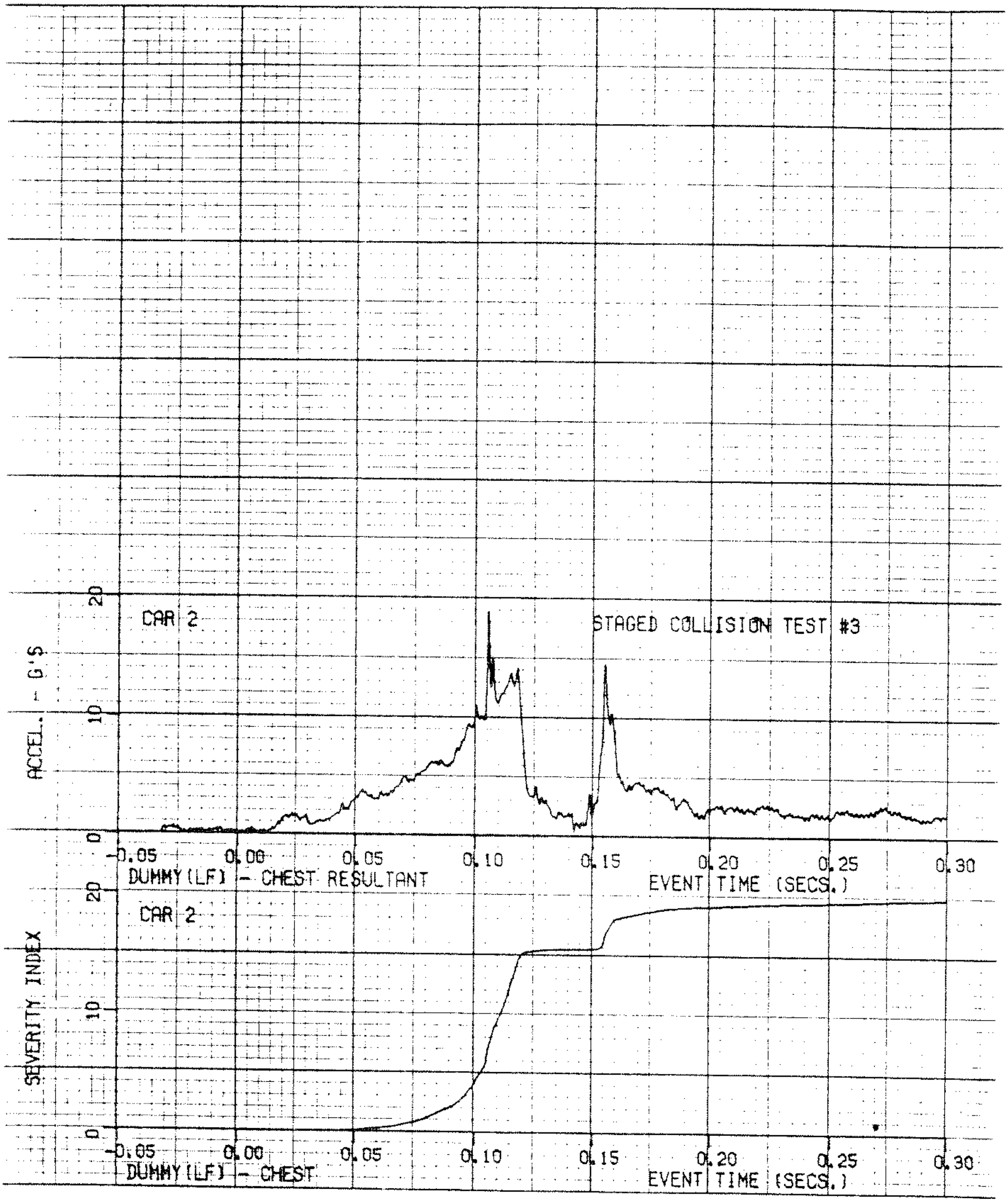

STAGED COLLISION TEST #3
CAR 2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
10
20
30
40
DUMMY (LF) - HEAD-Z COMP.
DISP. - IN.

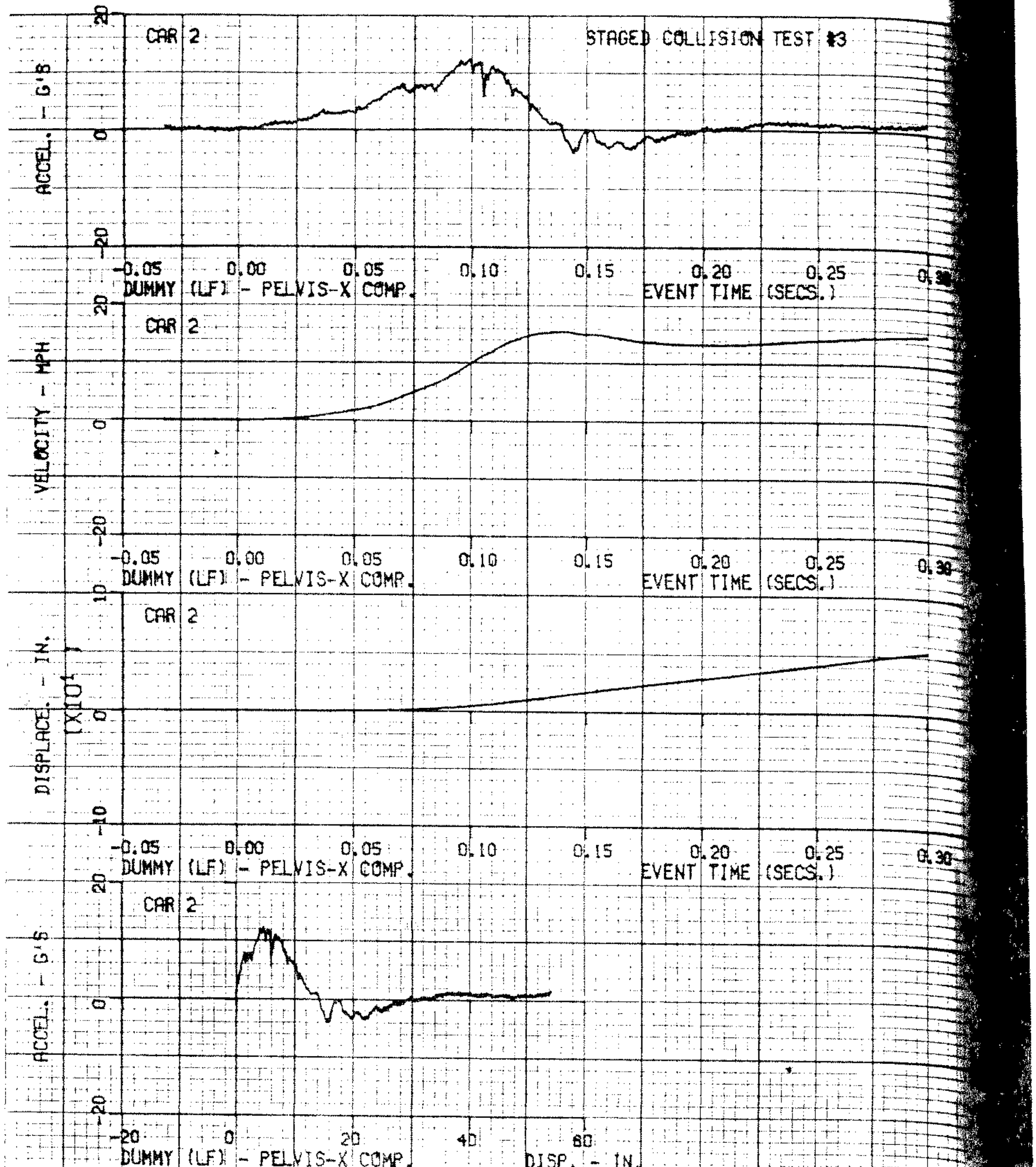

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD
EVENT TIME (SECS.)


STAGED COLLISION TEST #3
CAR 2
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
50
0
-50
-0.05 0.00 0.05 0.10 0.15 0.20 0.25
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20 0 20 40 60
DUMMY (LF) - CHEST-X COMP.
DISP. - IN.


STAGED COLLISION TEST #3
CAR 2
ACCEL. - G'S
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
20
0
-20
10
-10
-12
-8
-4
4


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20 0 20 40 60
DUMMY (LF) - CHEST-Z COMP.
DISP. - IN.


ACCEL. - G'S
20
10
0
CAR 2
STAGED COLLISION TEST #3
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - CHEST RESULTANT
EVENT TIME (SECS.)
SEVERITY INDEX
CAR 2
DUMMY(LF) - CHEST
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
0
20
40
60
DUMMY (LF) - PELVIS-X COMP.
DISP. - IN.

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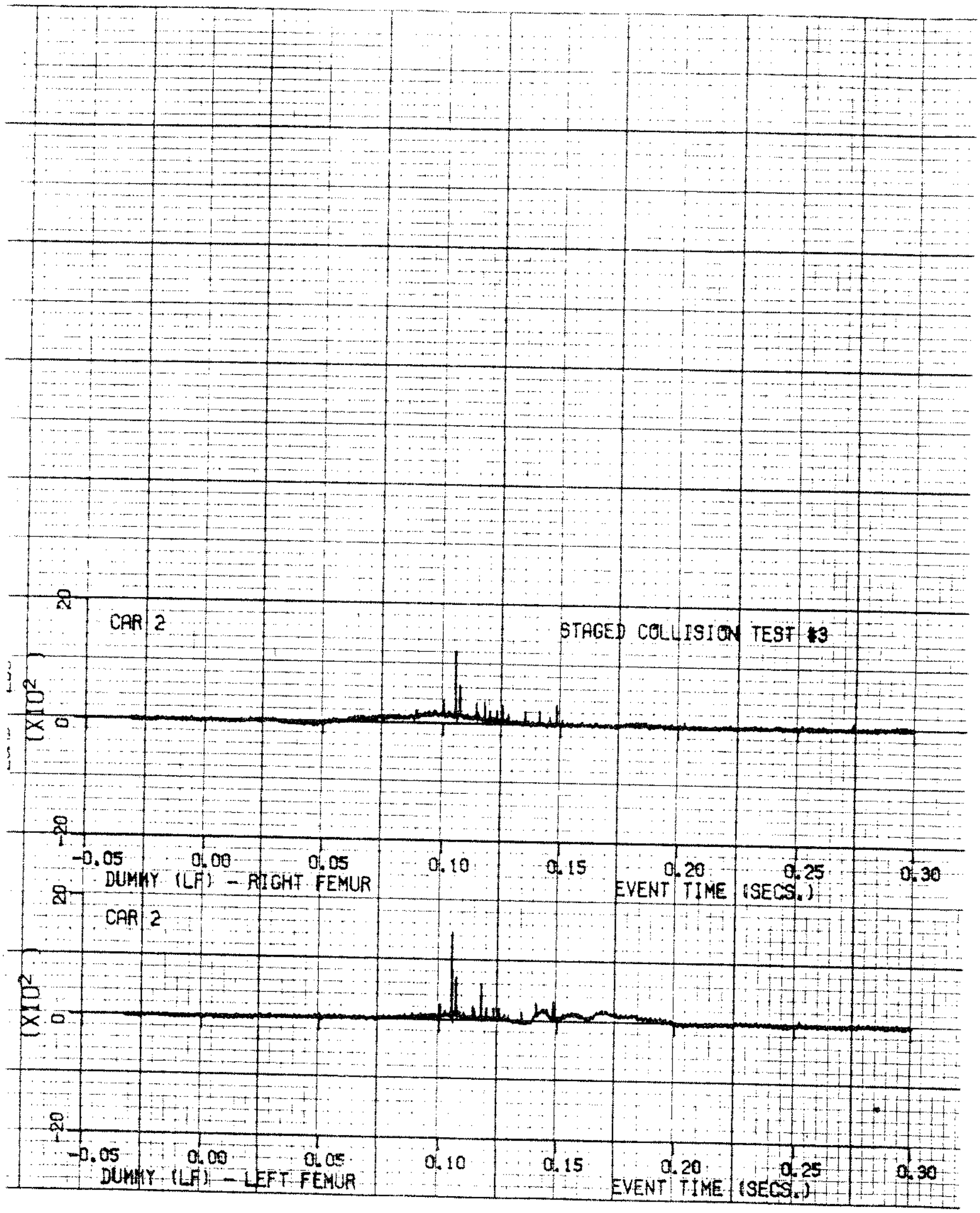
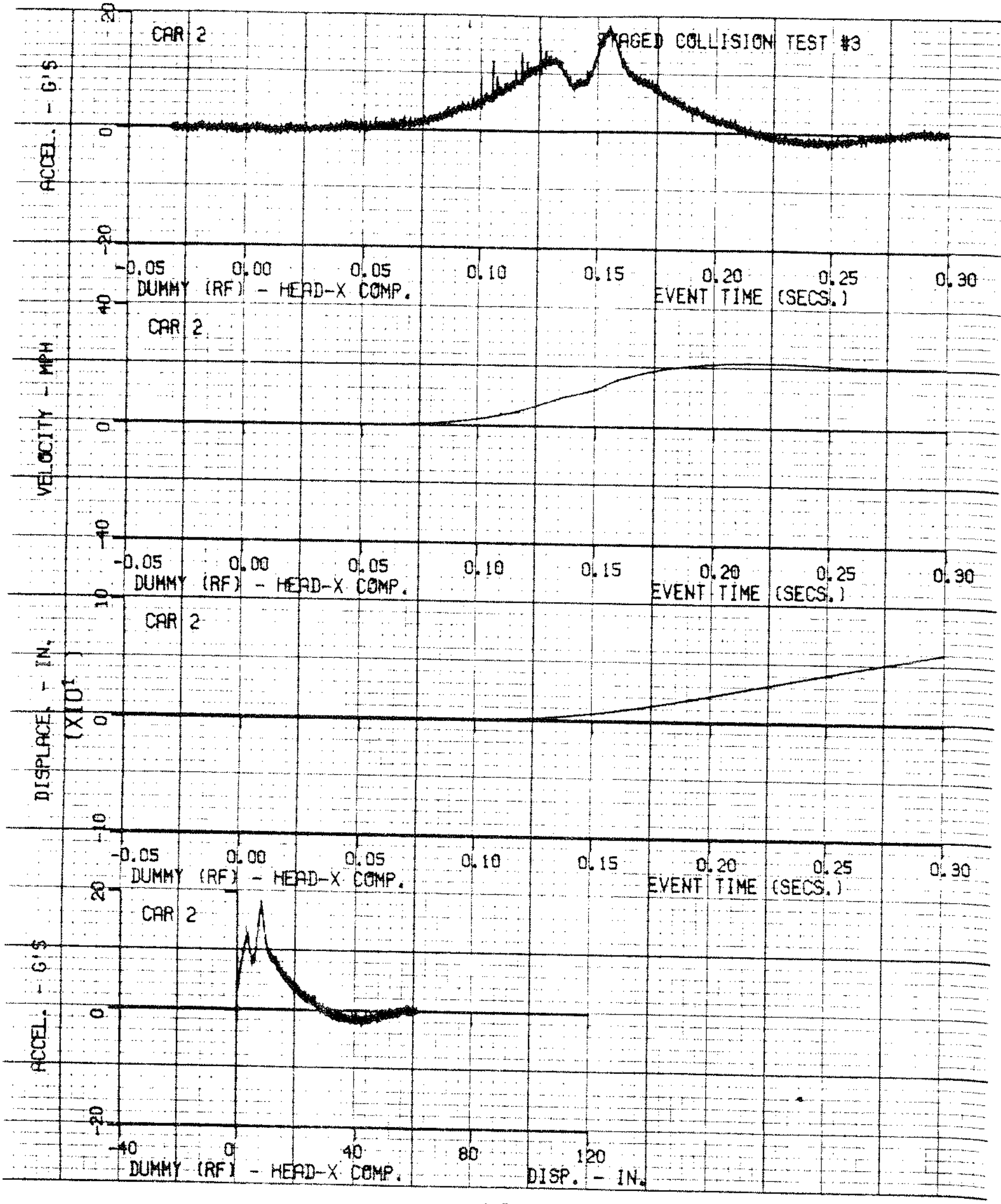
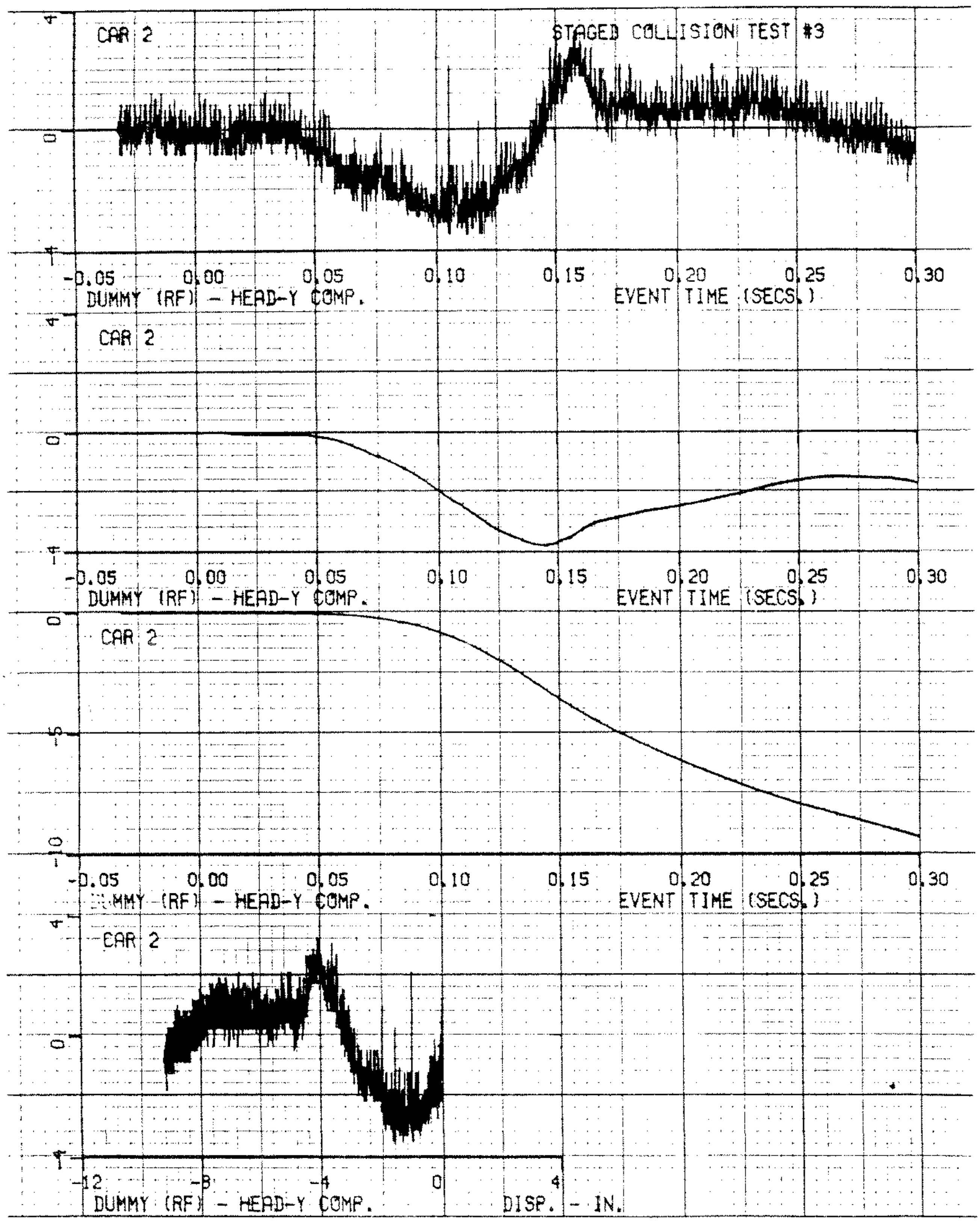
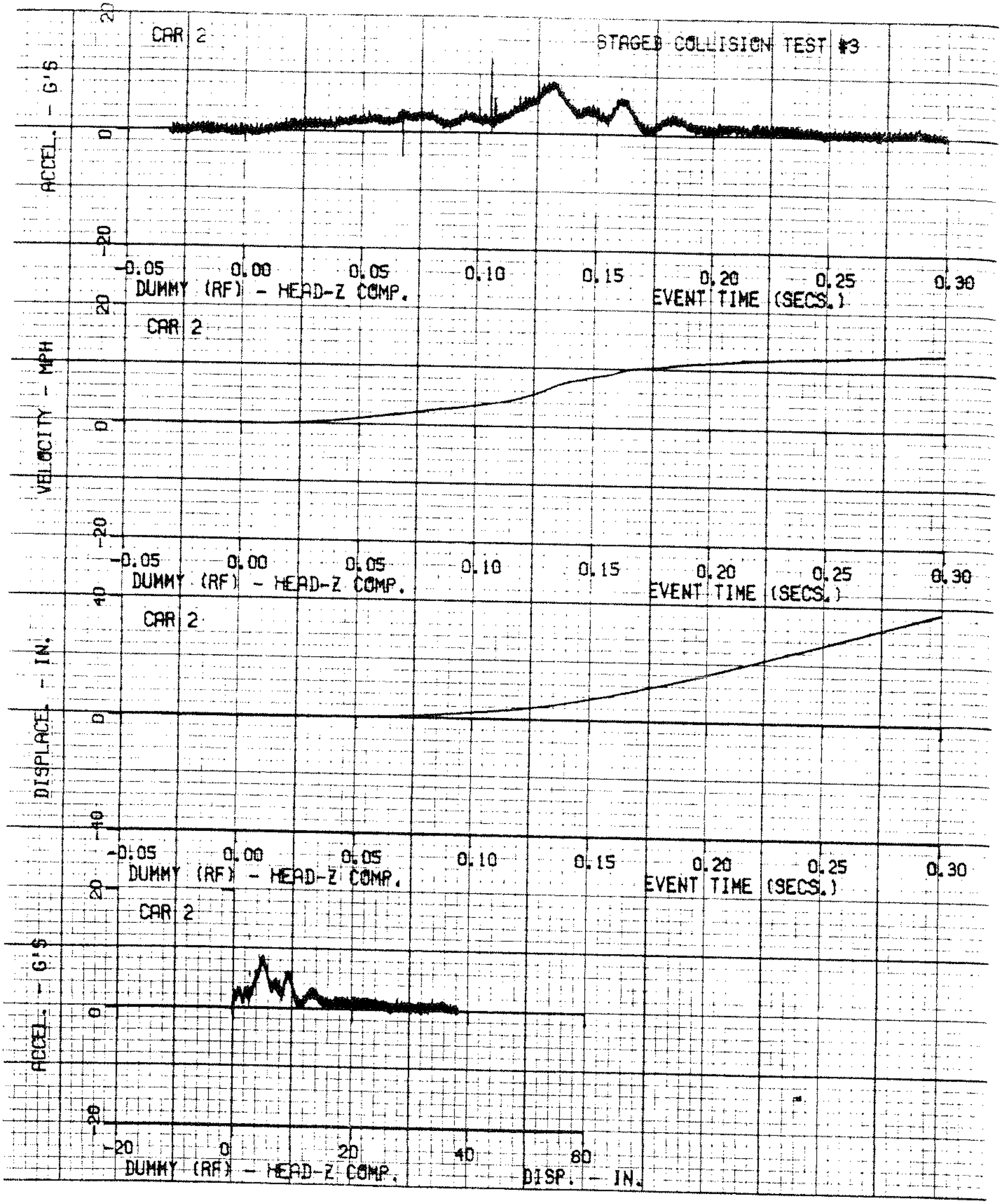


20
CAR 2
STAGED COLLISION TEST #3
(X10^2)
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - RIGHT FEMUR
EVENT TIME (SECS.)
20
CAR 2
(X10^2)
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - LEFT FEMUR
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-40
0
40
80
120
DUMMY (RF) - HEAD-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
-12 -8 -4 0 4
DUMMY (RF) - HEAD-Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
0
20
40
80
DUMMY (RF) - HEAD-Z COMP.
DISP. - IN.

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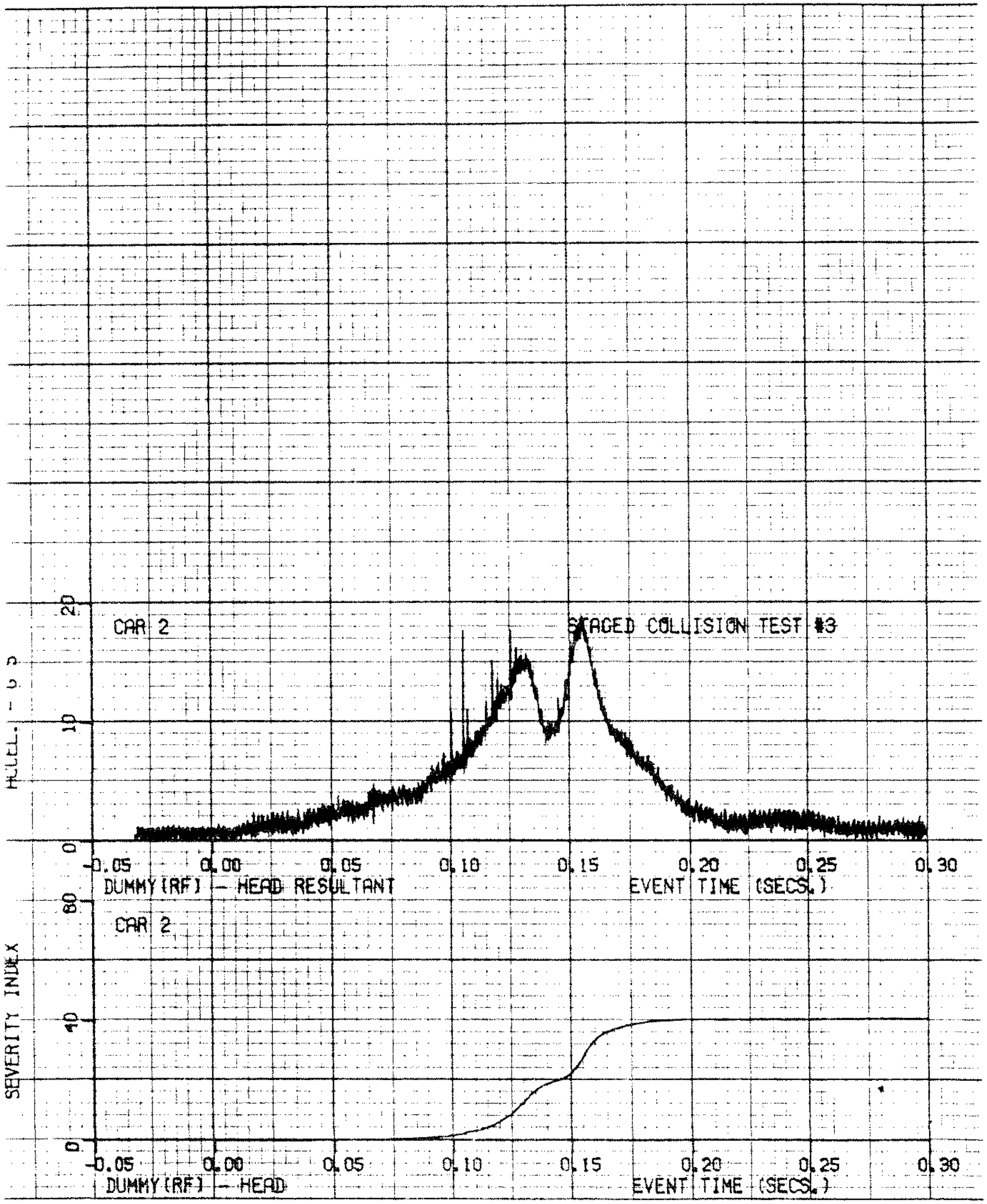
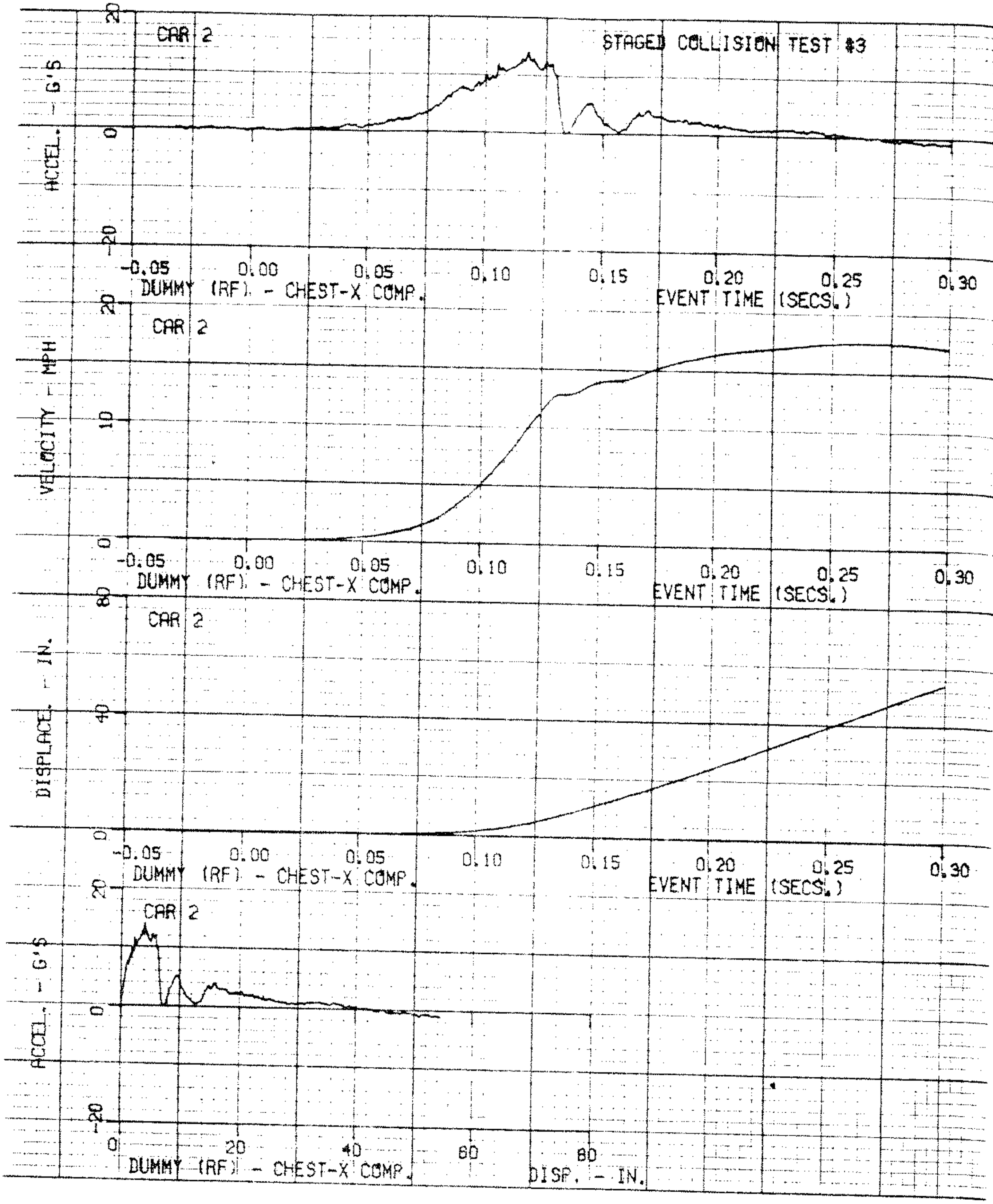
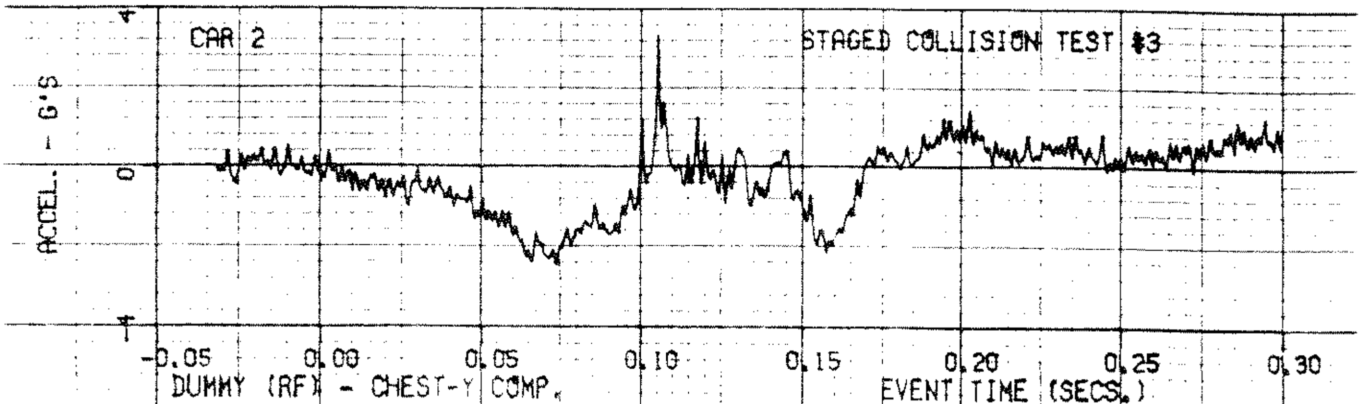
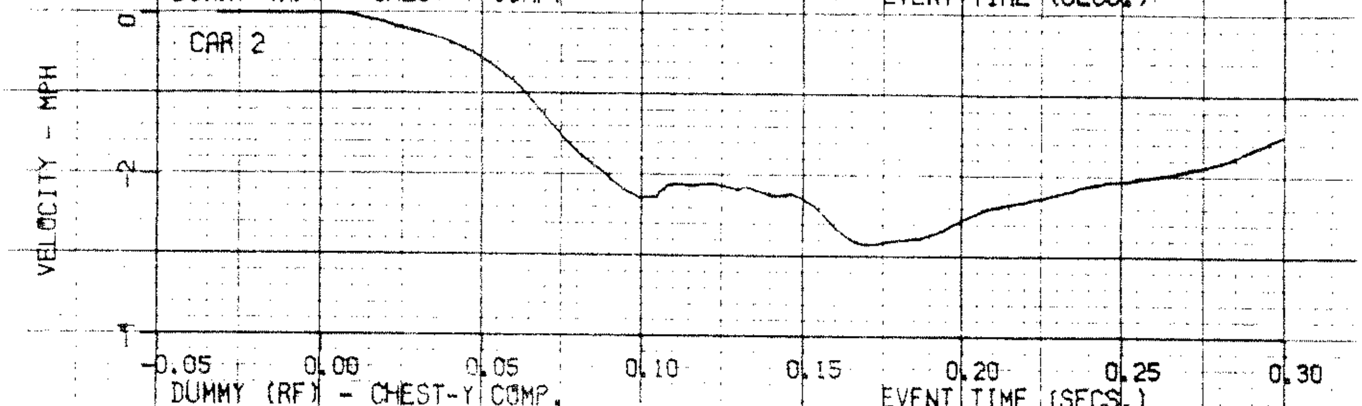
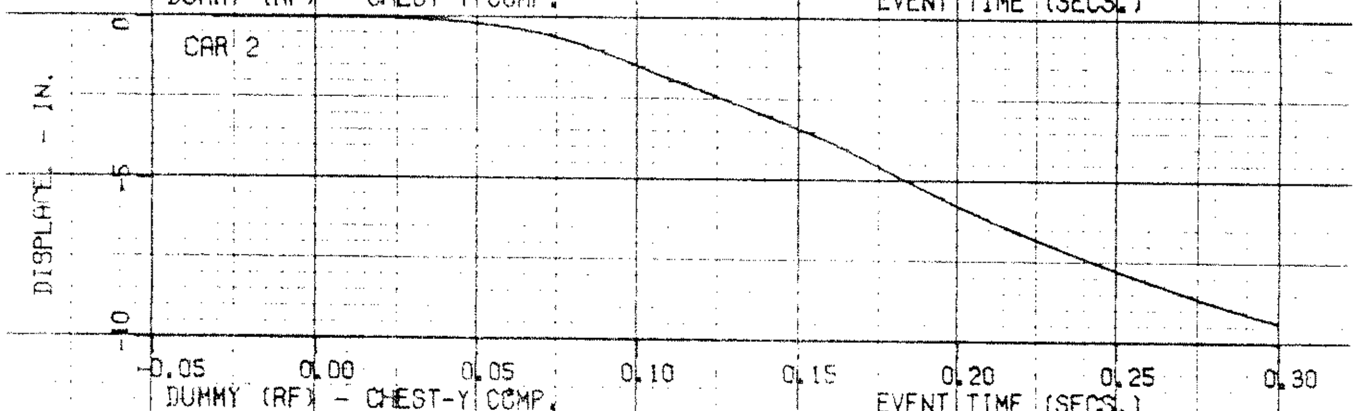
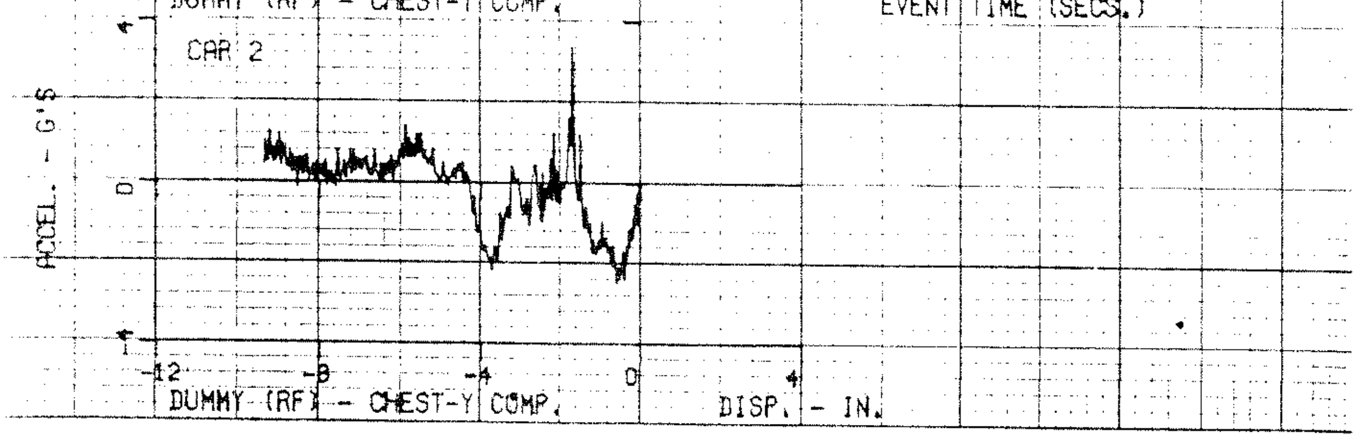

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD RESULTANT
EVENT TIME (SECS.)
SEVERITY INDEX
80
CAR 2
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD
EVENT TIME (SECS.)

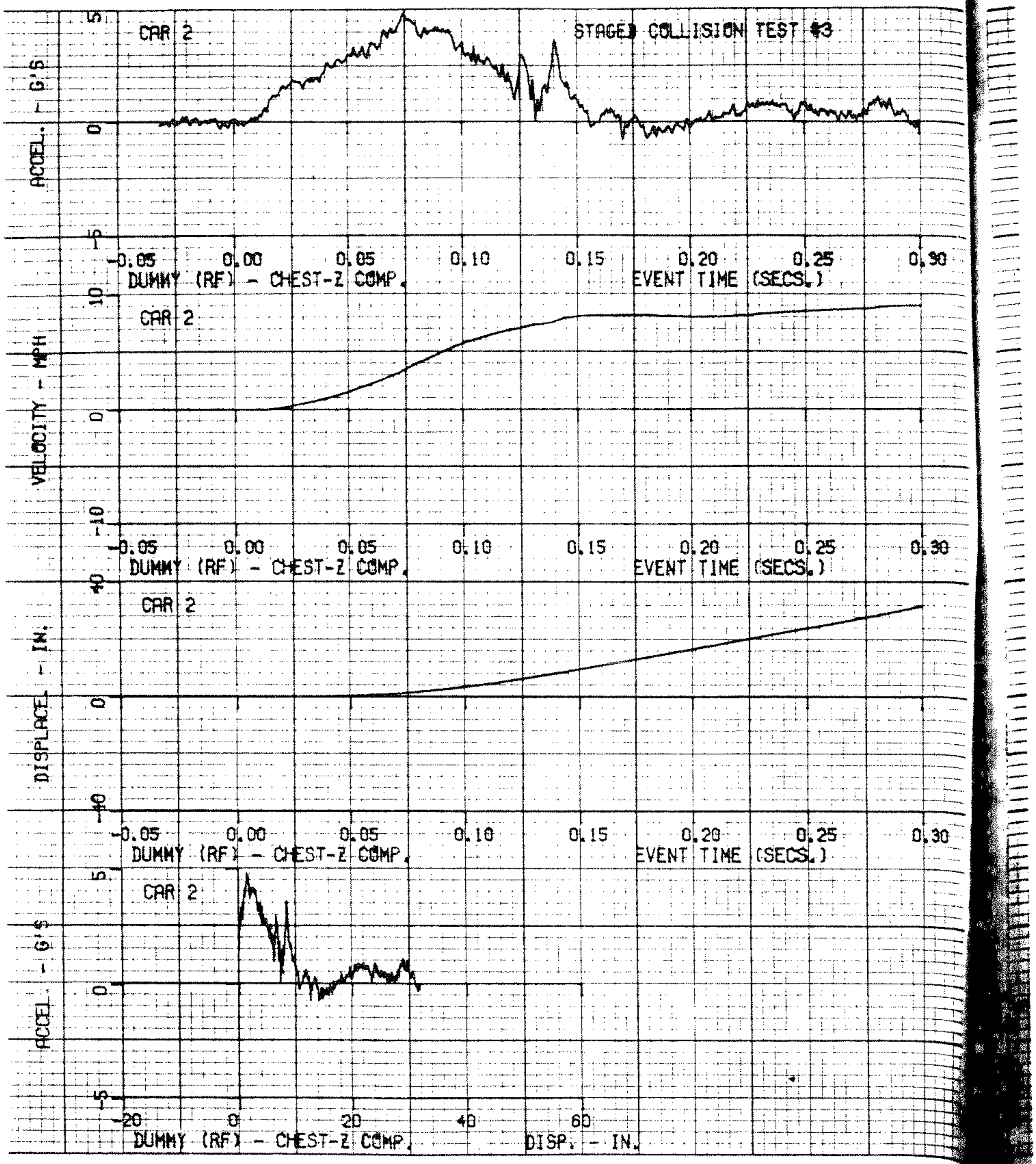

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
20
40
60
80
DUMMY (RF) - CHEST-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
VELOCITY - MPH
0
-2
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
DISPLACE. - IN.
0
-5
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
ACCEL. - G'S
4
0
-4
-12
-8
-4
0
4
DUMMY (RF) - CHEST-Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
5
0
-5
-20
0
20
40
60
DUMMY (RF) - CHEST-Z COMP.
DISP. - IN.

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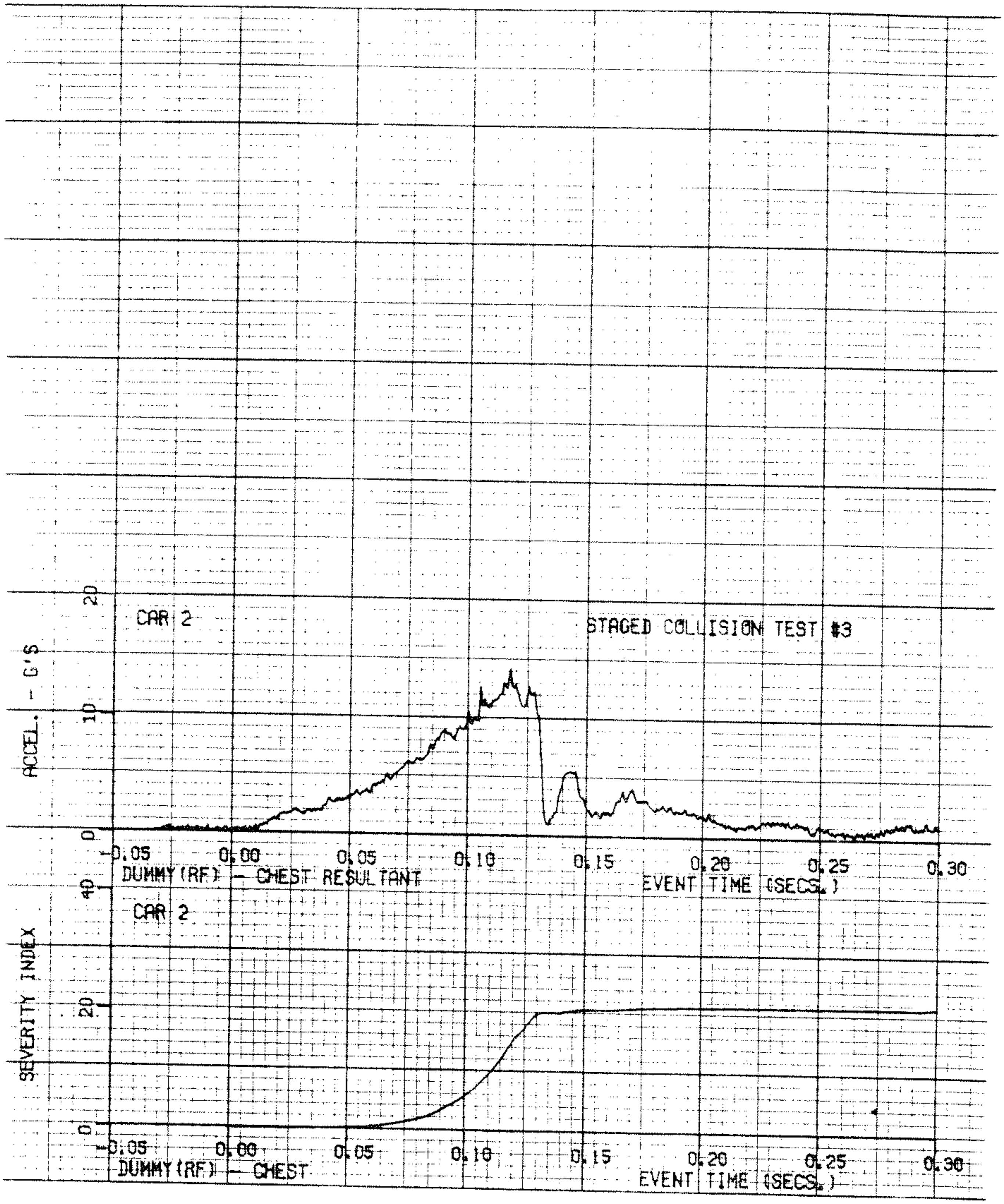
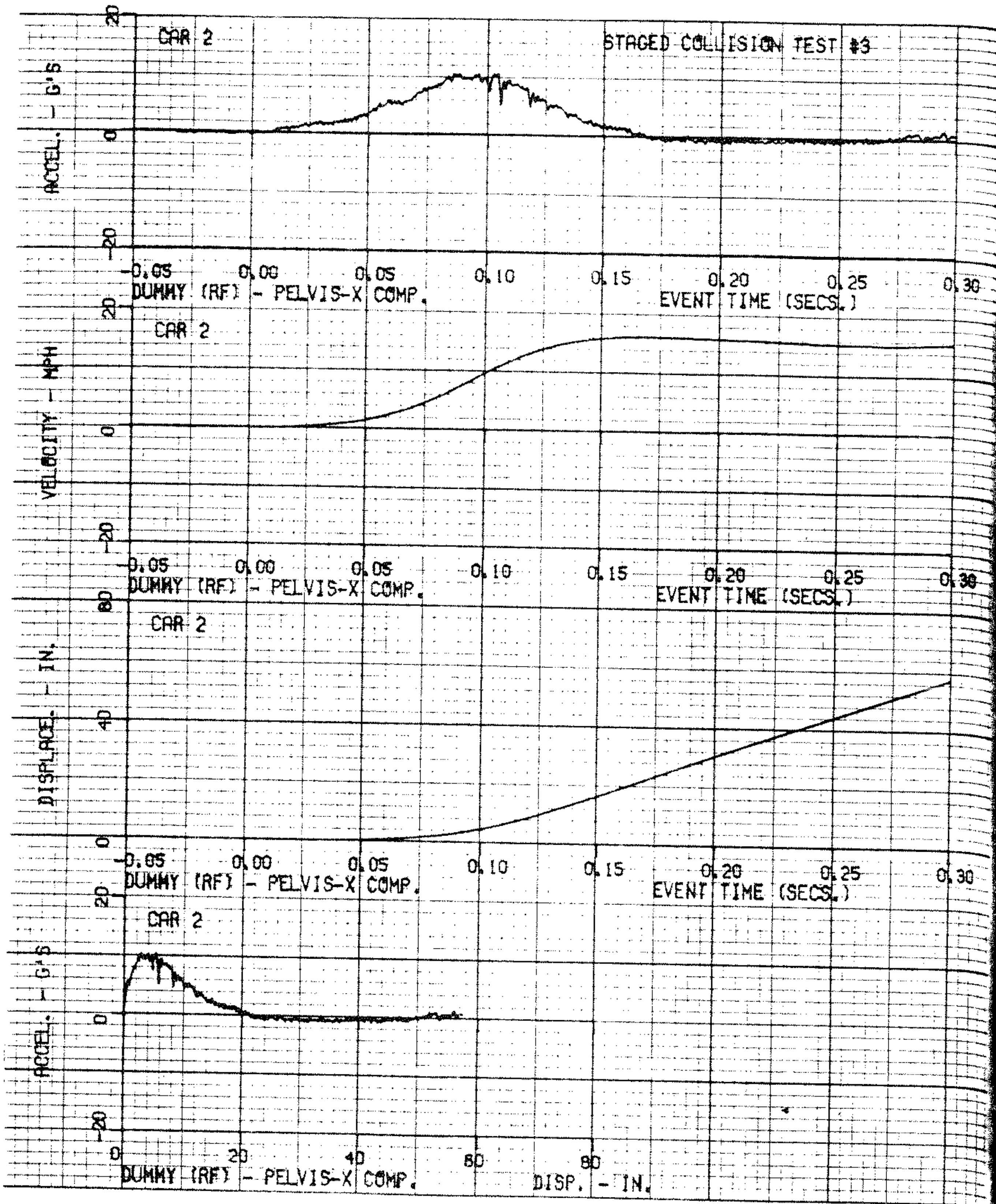

CAR 2
STAGED COLLISION TEST #3
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #3
ACCEL. — G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY — MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. — IN.
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. — G'S
20
0
-20
0
20
40
60
80
DUMMY (RF) - PELVIS-X COMP.
DISP. - IN.

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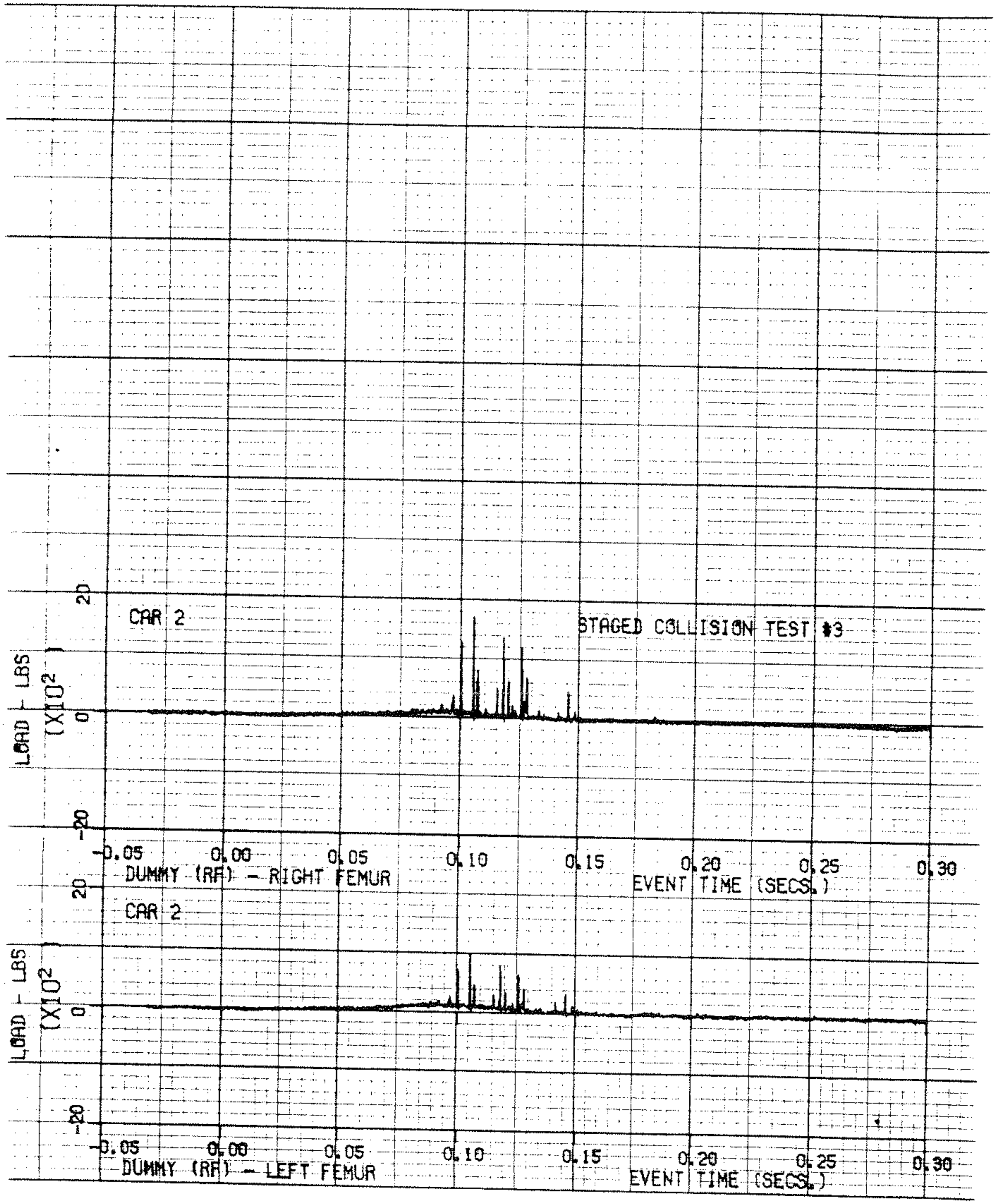
CAR 2
STAGED COLLISION TEST #3
LOAD - LBS (X10²)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - RIGHT FEMUR
EVENT TIME (SECS.)
CAR 2
LOAD - LBS (X10²)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - LEFT FEMUR
EVENT TIME (SECS.)

TEST NO. 4

RICSAC STAGED COLLISION

FRONT-TO-REAR
OBLIQUE - OFFSET

TORINO/PINTO

VELOCITY 38.7 MPH

10.0 RICSAC STAGED COLLISION - TEST NO. 4

EXPERIMENTAL RESULTS

Test Description

This staged collision involved a 1974 Ford Torino (V-1) striking the rear of a stationary 1974 Pinto (V-2) at an oblique 10 degree angle with a 26 inch offset as shown in Figure 10-1. The impact velocity was 38.7 mph. The vehicle test weights were 4980 and 3190 pounds for the Torino and Pinto, respectively. Each vehicle had two Part 572 test dummies (50 percentile) seated in the front seat. The dummies in the Pinto were instrumented according to FMVSS 208 and were unrestrained. In the Torino the dummies were uninstrumented and were restrained with seat belts.

The Torino was equipped with automatic transmission, power steering and power brakes. The Pinto had manual transmission, steering and standard brakes. The accident was staged with both transmissions in drive position, brakes off and the engines not running. During the collision no steering control inputs or vehicle braking was applied. The roadway was dry with skid resistance value of 87.

Approximately one car length before impact the vehicle tow cable was released and the vehicle guide rail was terminated. At this point in time and during the collision both vehicles are free bodies with no constraints except the normal collision forces and reactions encountered in this type of car-to-car collision. During the collision event no observed tow cable or instrumentation cable interference with the moving vehicles was noted.

ACCIDENT SCHEMATIC

VEHICLES:

No. 1 - 1974 FORD TORINO
No. 2 - 1974 FORD PINTO

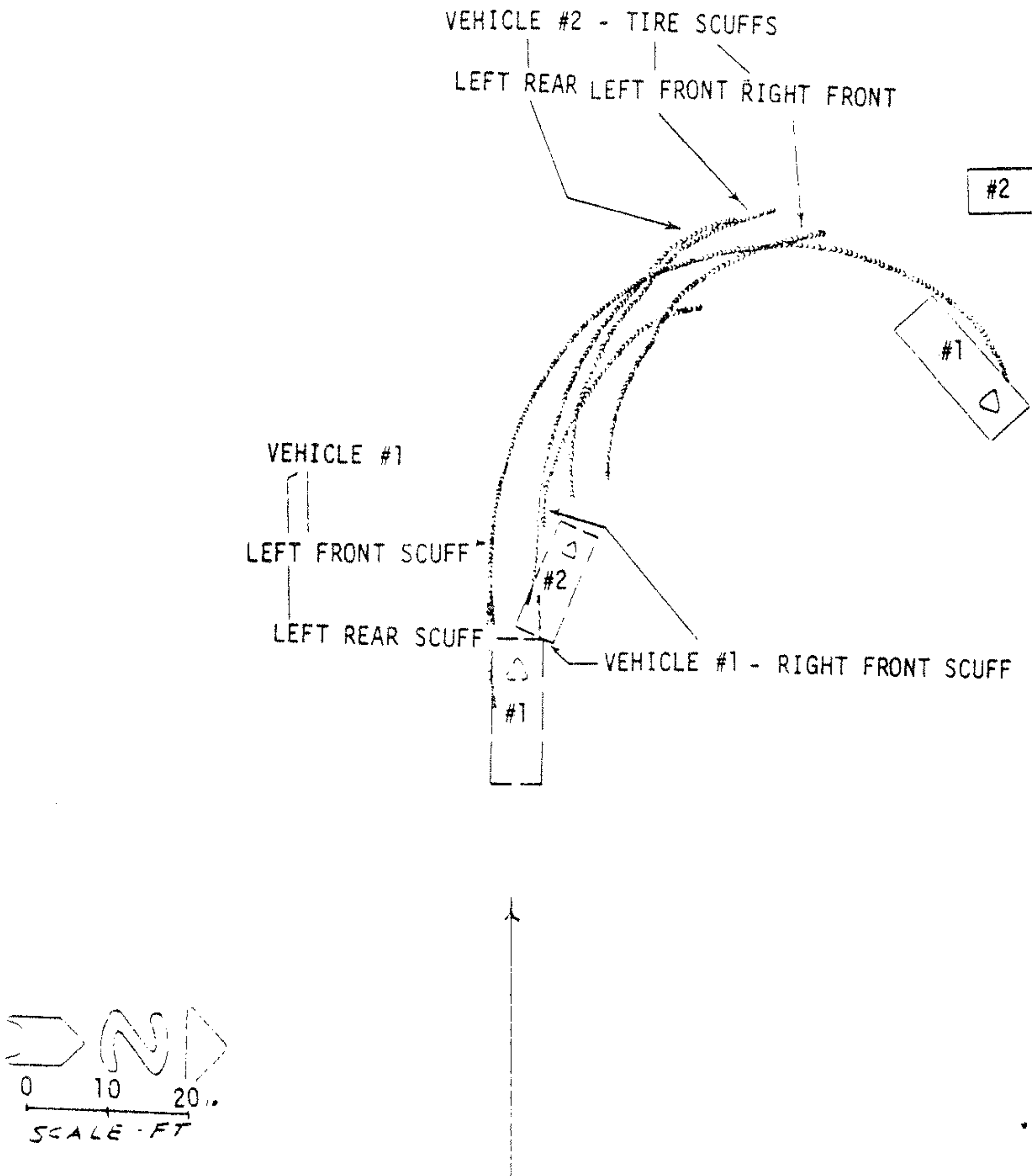

Figure 10-1 TEST NO. 4 - RICSAC ACCIDENT SCHEMATIC

CRASH TEST SUMMARY

TEST NO. 4 PROJECT Staged Car to Car Collision

DATE 4-28-78 TIME 14;10 TEMP. 65°F

TEST CONDITION Rear Oblique Offset (26 inch offset at 10 Deg.)

VEHICLE NO. 1 1974 Ford Torino

VEHICLE NO. 2 1974 Ford Pinto

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	4980	3190
IMPACT ANGLE (deg)*	0	10°
IMPACT VELOCITY (mph)**	38.71	0
MAX. CRUSH (in)	18.2"	36"
MAX. INTRUSION (in)		

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Part 572	Part 572
LOCATION	Driver (L.F.), Passenger (R.F.)	Driver (L.F.), Passenger (R.F.)
RESTRAINT	3-Point Restraint	Unrestrained
	(Uninstrumented)	(Instrumented)

NUMBER OF DATA CHANNELS 64
NUMBER OF HIGH SPEED CAMERAS 10

*WITH RESPECT TO TOW TRACK CENTERLINE
**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

TABLE 10-1

TEST NO. 4 - CAR NO. 1

VEHICLE DATA

TEAM	YEAR	MONTH	DAY	SEQUENCE
	8	0 4	2 8	

Vehicle data not collected. Reason? ______

Vehicle No. 1 — 14-15 No. of VIN Characters 1 1

-22 VIN (Left Justify, Omit Production Numbers) 4 H 2 7 Q 2 3

-27 Make/Model (CPIR Code) Ford/Torino 1 2 1 0 1

-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more; 99999 = Unknown 6 5 9 7 4.

-34 Model Year 7 4

-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

-39 Curb 0 4,0 0 0

-42 Occupant and Cargo Only ___ ___,___ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

	Object Contacted	CDC	Veh. No.	Impact No.
-54 (1)	C 1	1 2 | F Z E W | 2	2	1
-65 (2)				
(3)				
(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ______	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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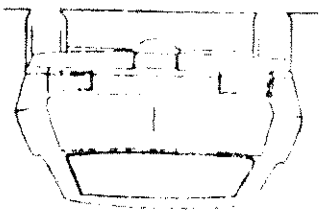
VEHICLE CRUSH SCHEMATIC
TEST NO. 4 - CAR NO. 1

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 1
LF 2
RR 2
LR 2

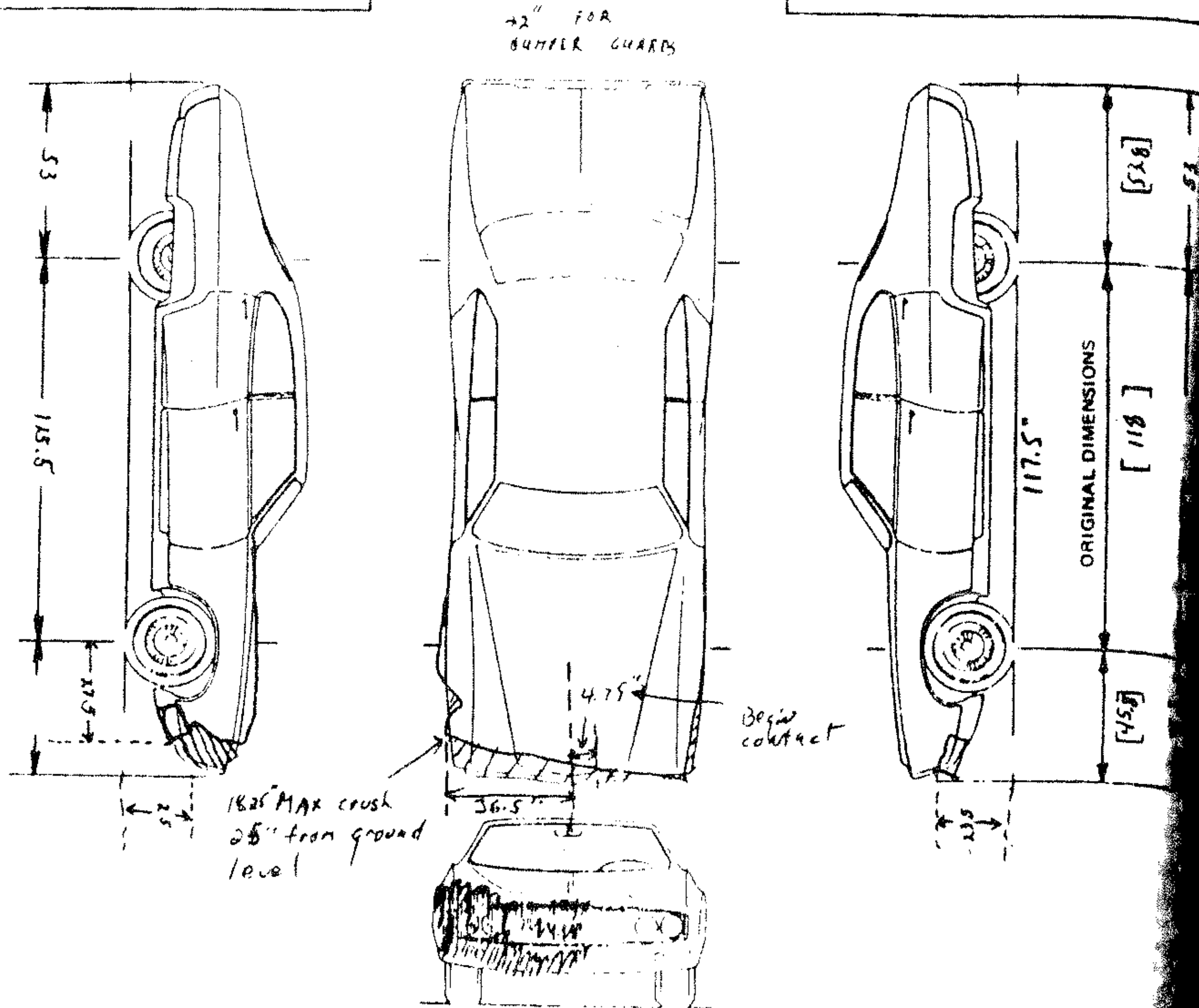
1 Yes, 2 No, 8 NA, 9 Unk.



WHEEL STEER ANGLES*
(For locked front wheels or placed rear axles only)

RF	±	2	1
LF	±	2	0
RR	±	0	0
LR	±	0	0

Within ±



NOTE: ALL MEASUREMENTS IN I

IMPACT #	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	41.5	6.25	7.75"	9.75"	12.5"	14.75"	18.25"	+ 16.
2								
3								
4								

14-31

NOTE: MEASURE C_1 to C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

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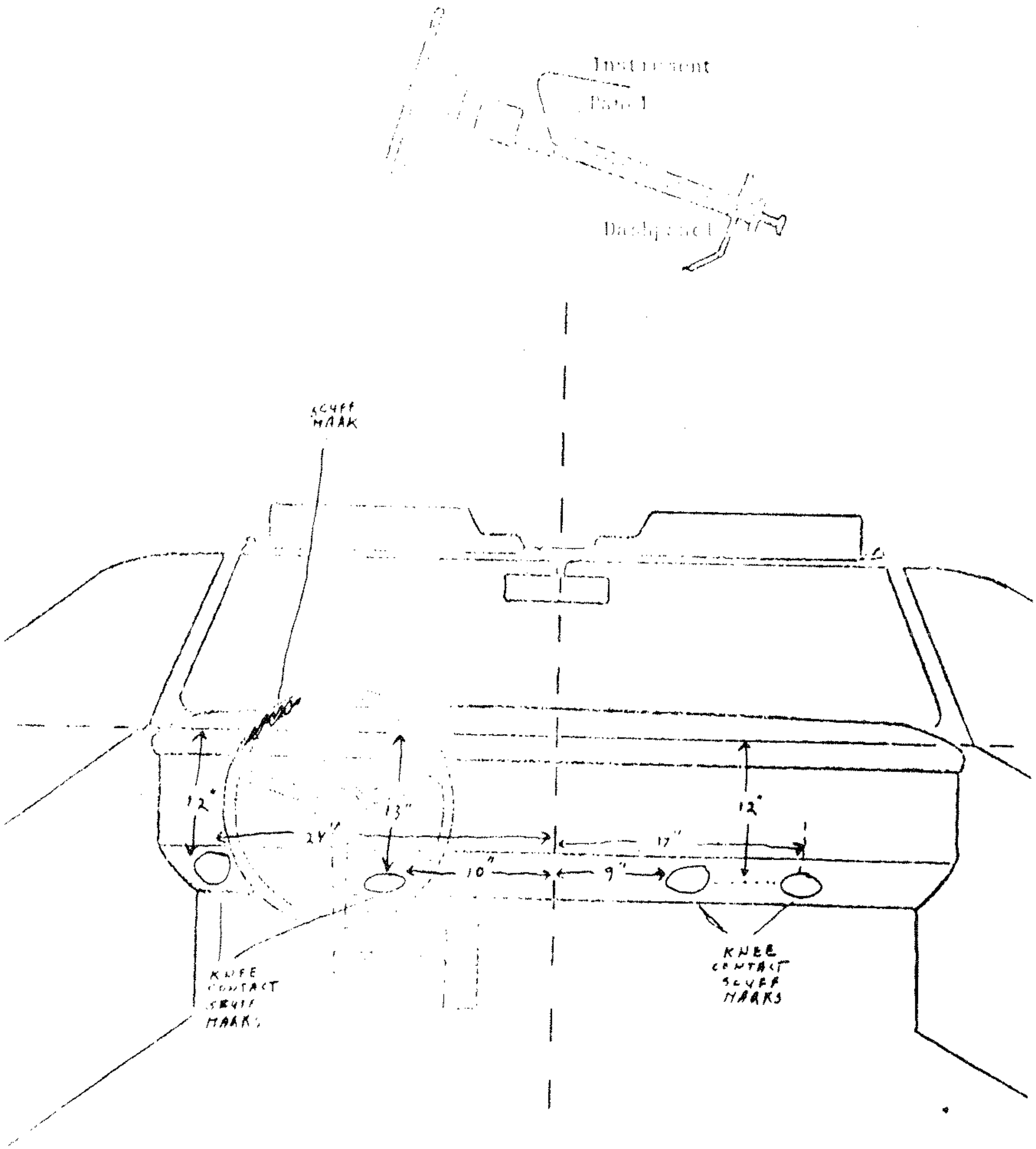
Figure 10-3

OCCUPANT CONTACT DATA
TEST NO. 4 - CAR NO. 1

VEHICLE INTERIOR

Occupant Contact



Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

TABLE 10-2

TEST NO. 4 - CAR NO. 2
VEHICLE DATA

TEAM	YEAR	MONTH	DAY	SEQUENCE
_	8	0 4	2 8	_ _ _

Vehicle data not collected. Reason? ______

Vehicle No. 2

14-15 No. of VIN Characters 1 1

16-22 VIN (Left Justify, Omit Production Numbers) 4 T 1 0 X 1 8

23-27 Make/Model (CPIR Code) Ford/Pinto 1 2 1 1 8

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more 9 9 9 9 9
99999 = Unknown

33-34 Model Year 7 4

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 0 2 , 4 0 0

40-42 Occupant and Cargo Only _ _ , _ 0 0

43 TOWING ANOTHER VEHICLE
Yes 1
No 0
Unknown 9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 3	0 5 B Y E W 6	1	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE
Yes 1
No 2
Unknown 9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ______	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE
Yes 1
No 2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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Figure 10-4

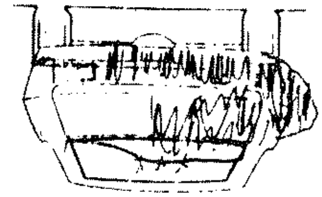
VEHICLE CRUSH SCHEMATIC
TEST NO. 4 - CAR NO. 2

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 2
LF 2
RR 2
LR 1

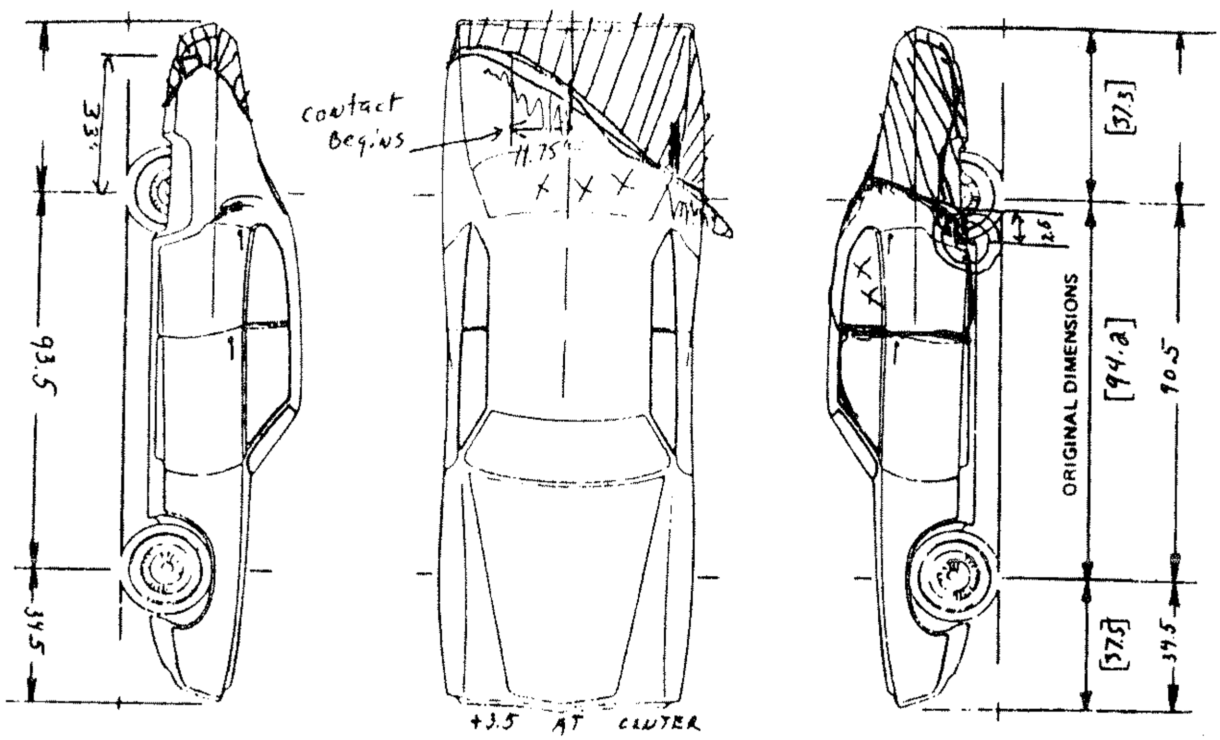
1 Yes, 2 No, 8 NA, 9 Unk.



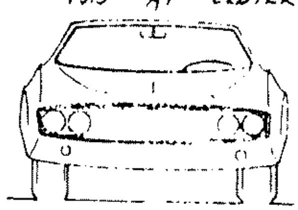
WHEEL STEER ANGLES*
(For locked front wheels or displaced rear axles only)

RF ± NA
LF ± NA
RR 0 ± 0 4
LR 0 ± 0 3"

Within ± 5°



Very minor and impact
only Paint damage on bumper
L: 6" All Cs are 0"
C, is located 26" right
of center



NOTE: ALL MEASUREMENTS IN INCHES

	IMPACT #	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
14-31	1	41.75"	36.0"	31.75"	29.0"	24.0"	19.5"	14.75"	-9.13
	2								
	3								
	4								

NOTE: MEASURE C_1 to C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

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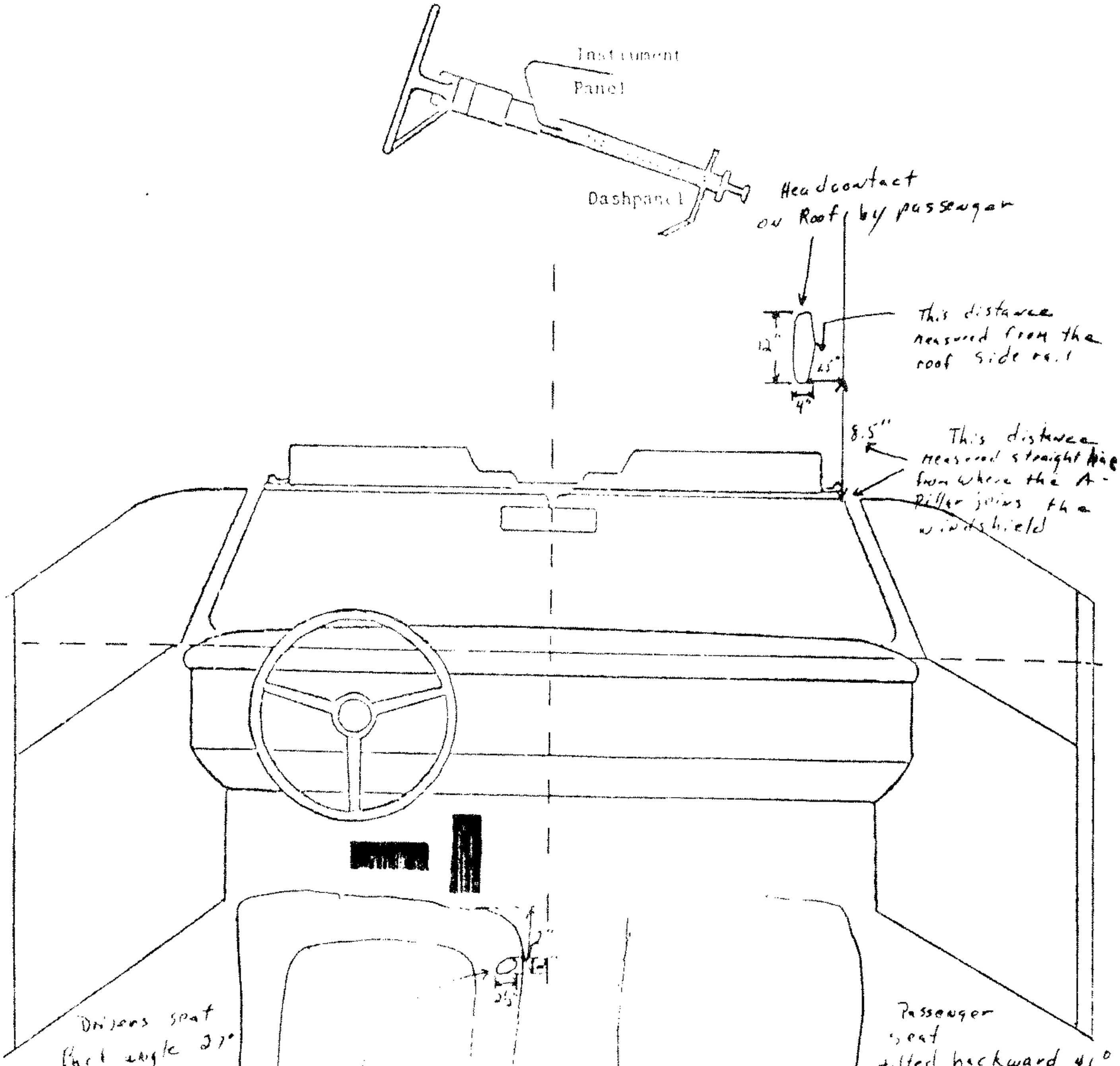
Figure 10-5

OCCUPANT CONTACT DATA
TEST NO. 4 - CAR NO. 2

VEHICLE INTERIOR

Occupant Contacts



Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

Head contact on the right side of Driver's bucket back rest by passenger possible rebound contact.

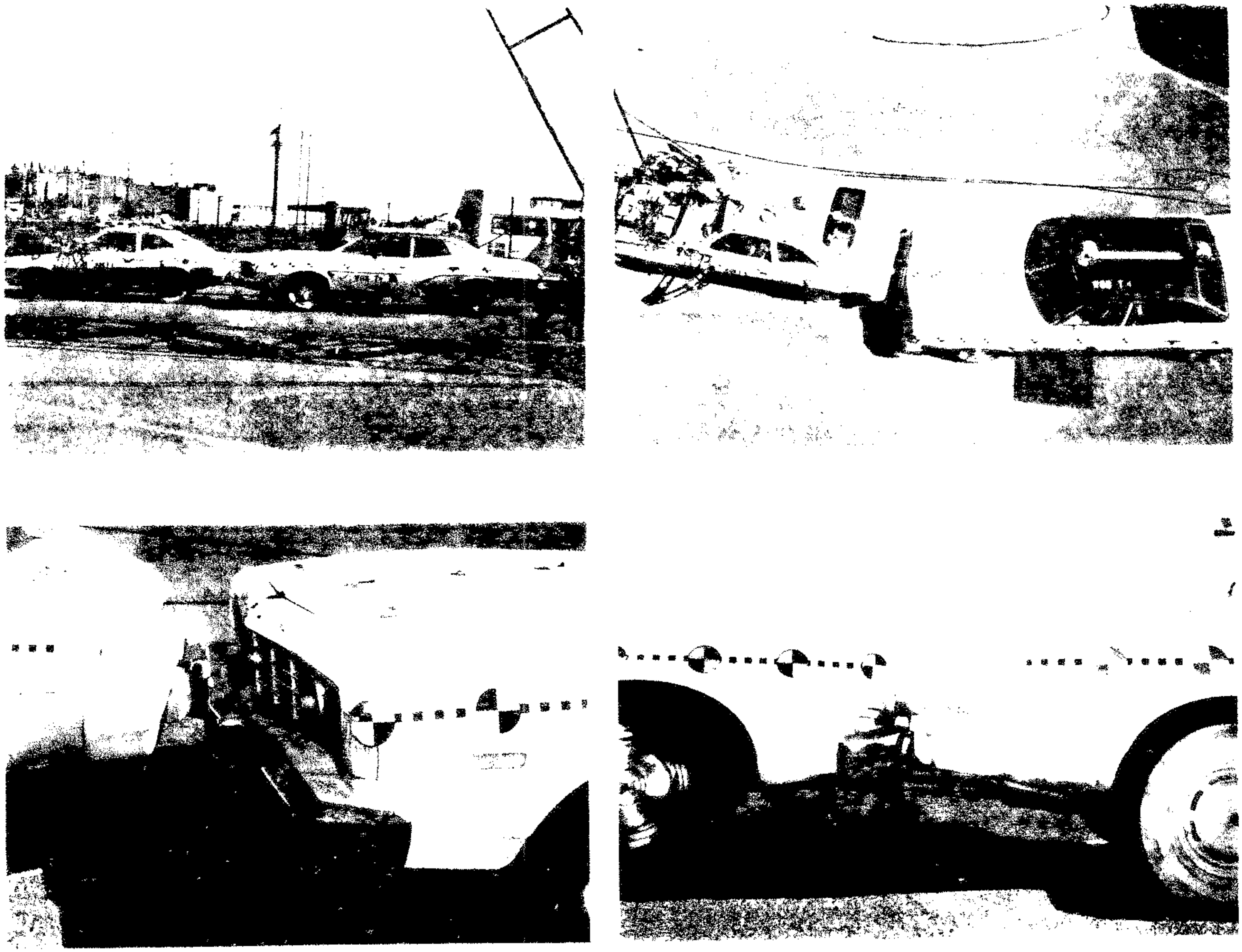


Figure 10-6 TEST NO. 4 – PRE TEST COLLISION CONFIGURATION

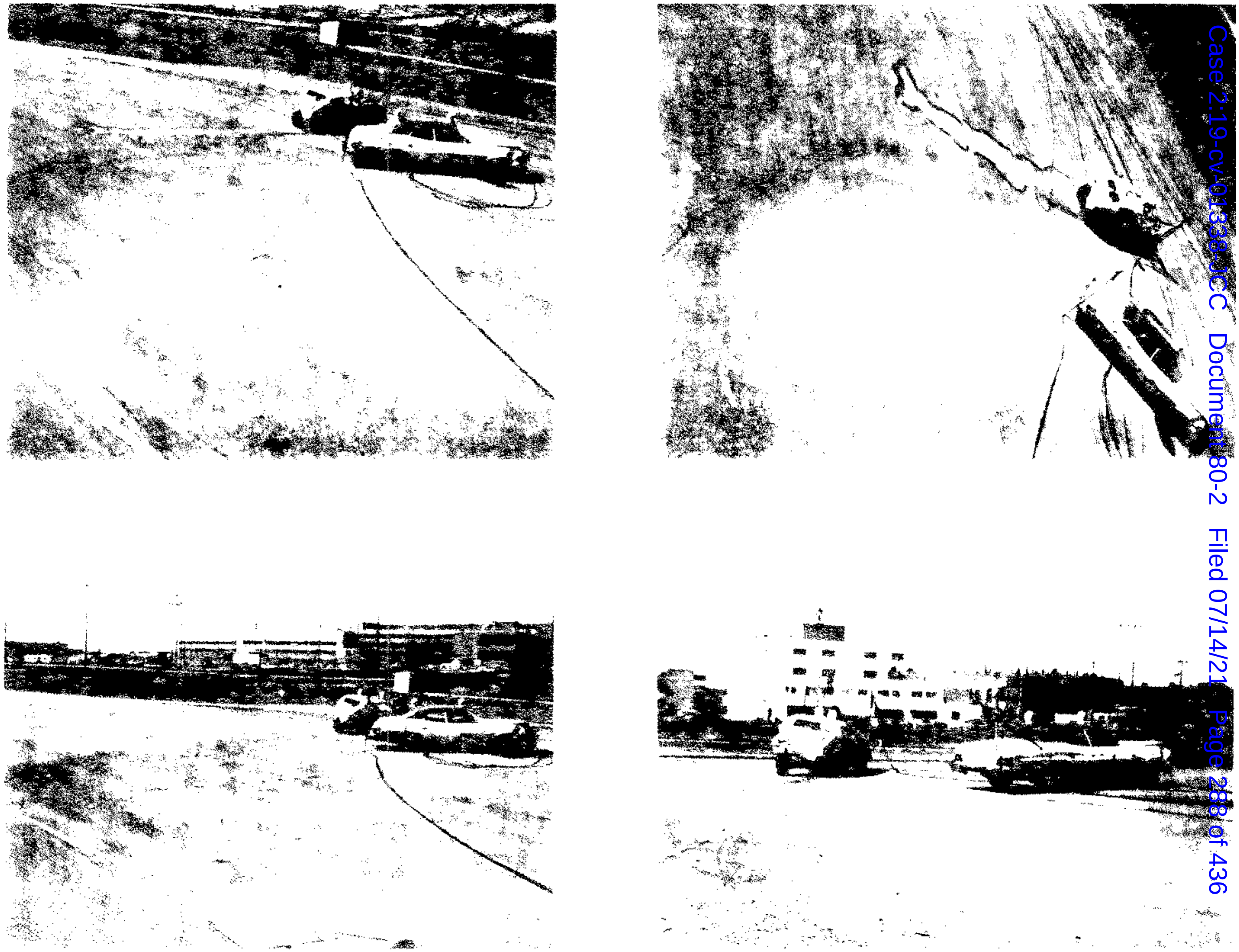


Figure 10-7 TEST NO. 4 — POST TEST COLLISION SCENE

Figure 10-10 TEST NO. 4 — PRE & POST INTERIOR VIEWS, CAR NO. 1 — TORINO

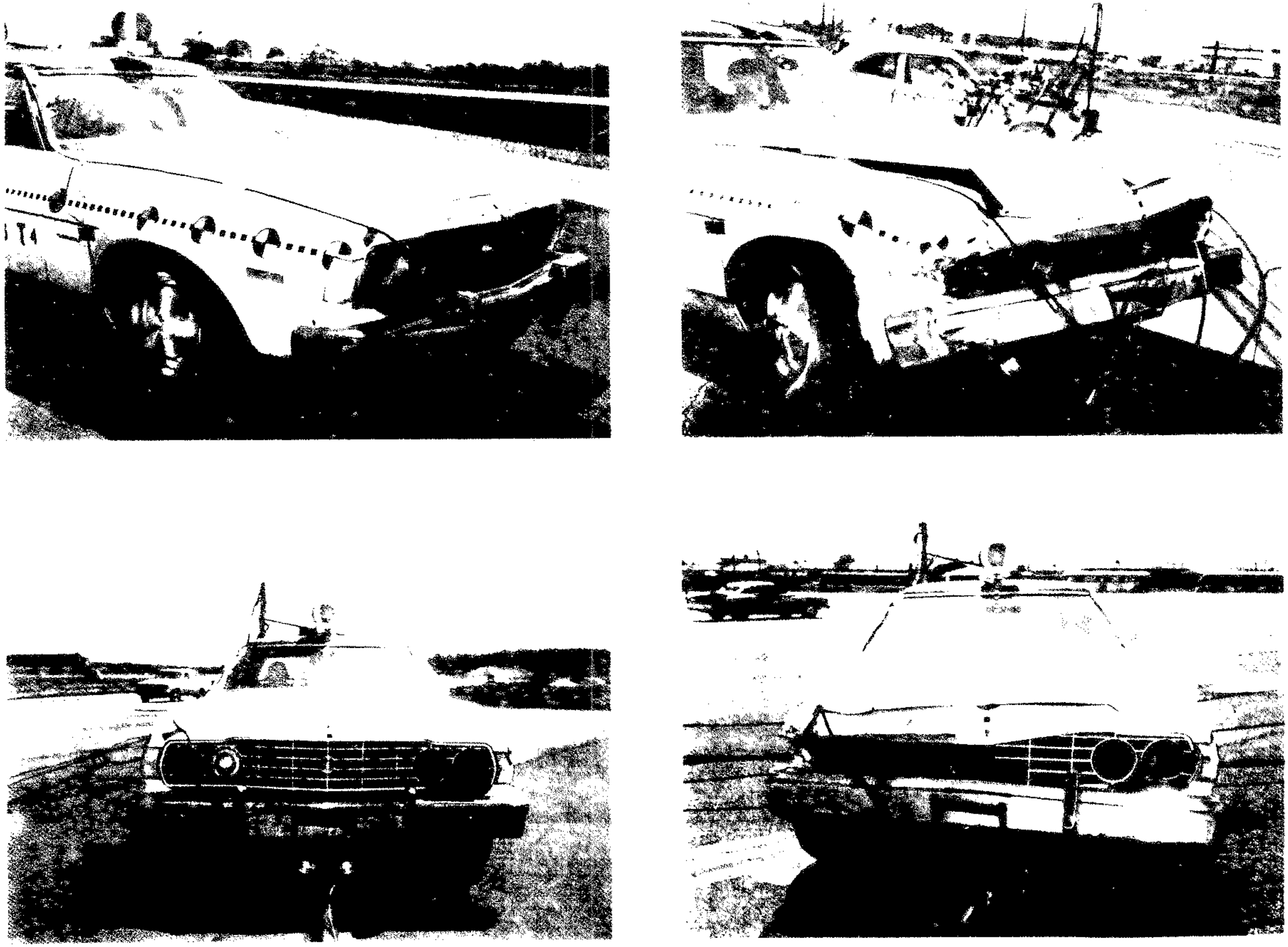


Figure 10-8 TEST NO. 4 – PRE & POST EXTERIOR VIEWS, CAR NO. 1 – TORINO

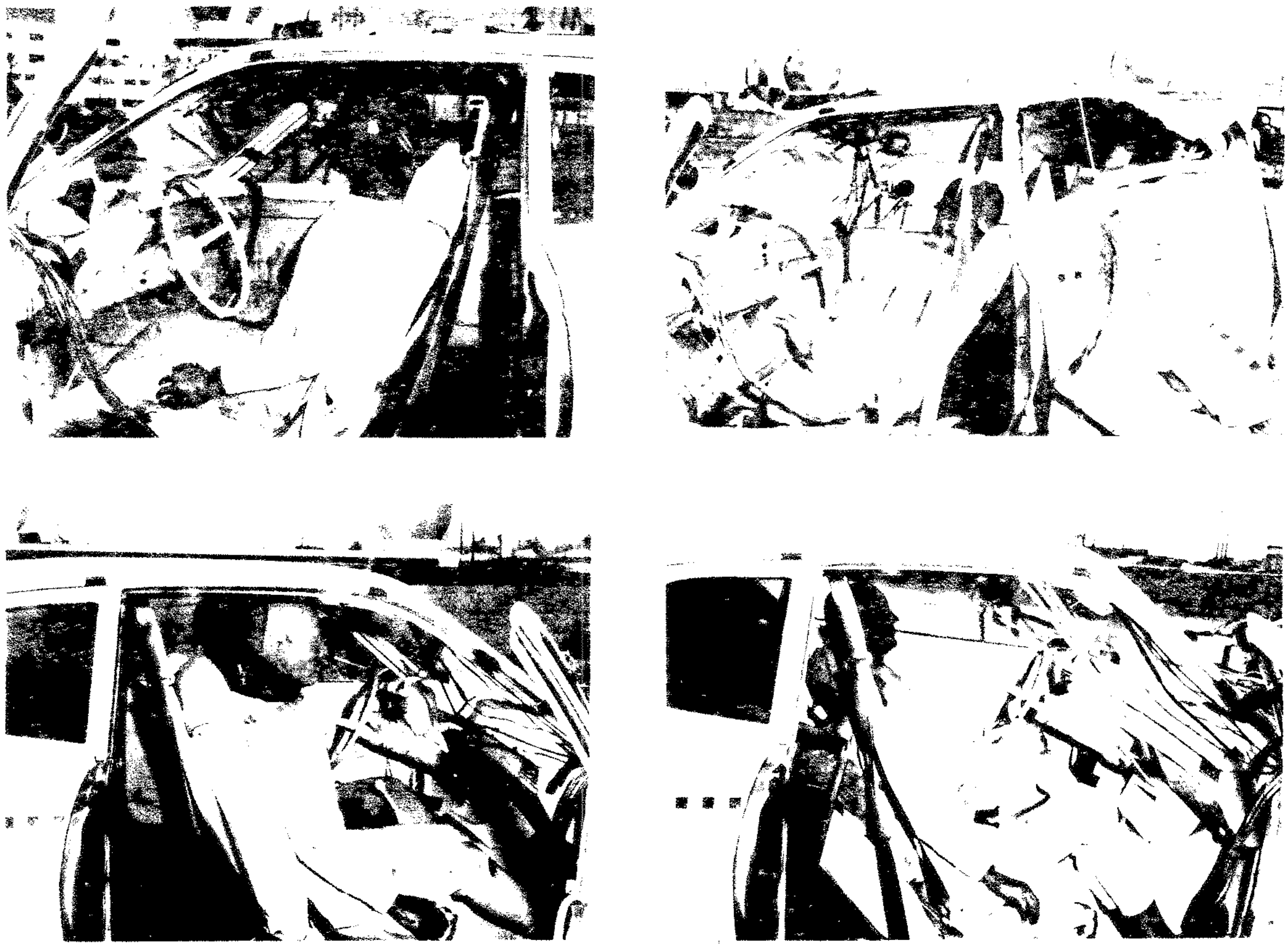


Figure 10-11 TEST NO. 4 – PRE & POST INTERIOR VIEWS, CAR NO. 2 – PINTO

ELECTRONIC INSTRUMENTATION TEST No. 4

BULLET VEHICLE - CAR 1 - 1974 FORD TORINO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	Left Front Corner
2	X,Y,Z	Floorpan R.R. Corner	Right Rear Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Rear Deck	Rear Deck
5	X	Bumper	Bumper
VEHICLE ATTITUDE			
Pitch Angle - 6		Gyro Package	Vehicle Pitch Angle
Roll Angle - 6		Gyro Package	Vehicle Roll Angle
Yaw Angle - 6		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 6		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle-Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.R. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
7	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 10-12 VEHICLE INSTRUMENTATION LOCATIONS

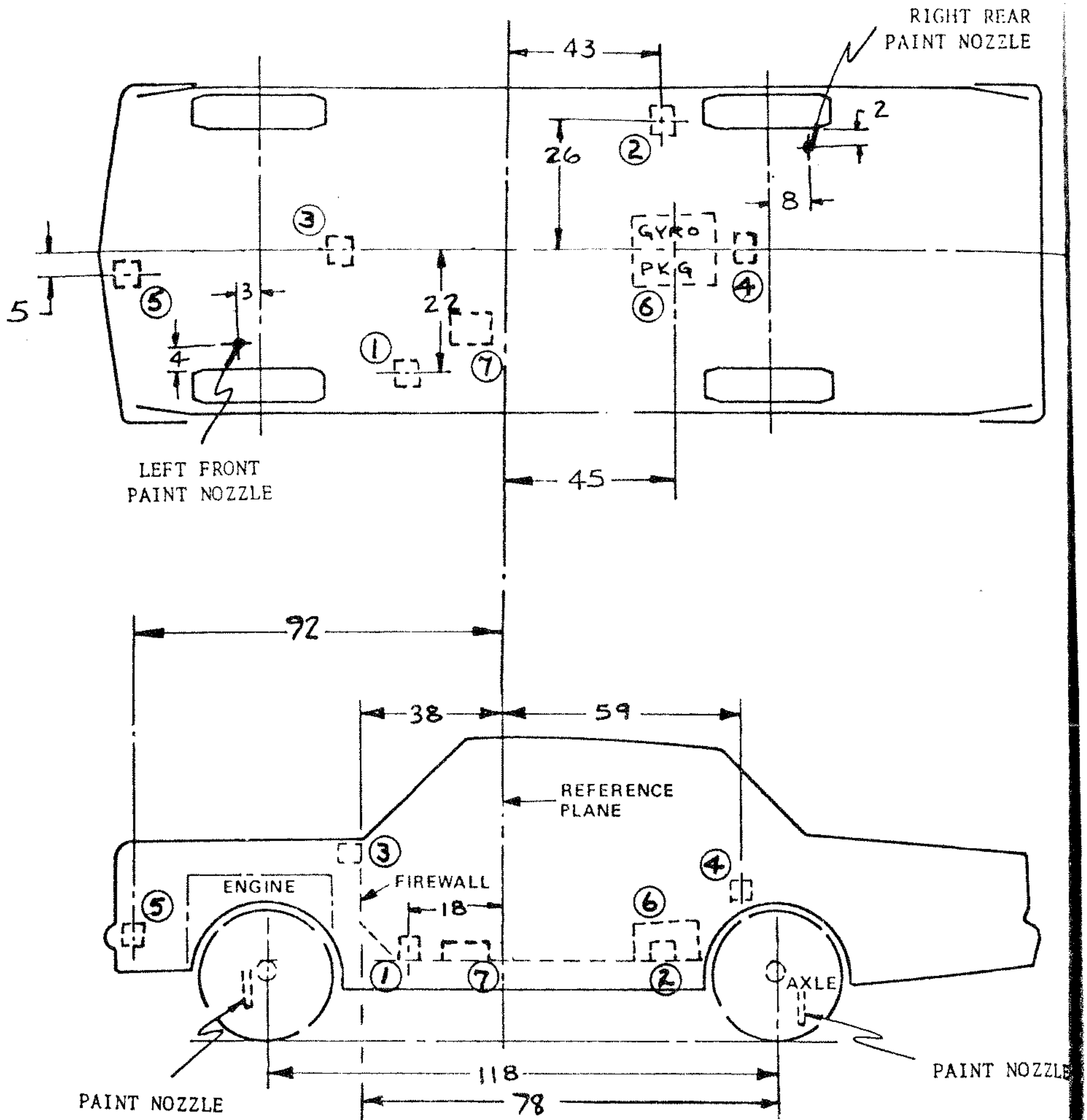


Figure 10-12 VEHICLE INSTRUMENTATION LOCATIONS*

CAR 1 - 1974 FORD TORINO - TEST NO. 4

ELECTRONIC INSTRUMENTATION TEST No. 4

TARGET VEHICLE - CAR 2 - 1974 FORD PINTO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	L.F. Corner
2	X,Y,Z	Floorpan L.R. Corner	R.F. Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Front Deck	Rear Deck
VEHICLE ATTITUDE			
Pitch Angle - 5		Gyro Package	Vehicle Pitch Angle
Roll Angle - 5		Gyro Package	Vehicle Roll Angle
Yaw Angle - 5		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 5		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle-Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.F. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
DUMMY			
L.F. Head	X,Y,Z	L.F. Seat	Dummy L.F. Head
L.F. Chest	X,Y,Z	L.F. Seat	Dummy L.F. Chest
L.F. Femurs	R,L**	L.F. Seat	Dummy L.F. Femur
L.F. Pelvic	X	L.F. Seat	Dummy L.F. Pelvic
R.F. Head	X,Y,Z	R.F. Seat	Dummy R.F. Head
R.F. Chest	X,Y,Z	R.F. Seat	Dummy R.F. Chest
R.F. Femurs	R,L**	R.F. Seat	Dummy R.F. Femur
R.F. Pelvic	X	R.F. Seat	Dummy R.F. Pelvic
6	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 10-13 VEHICLE INSTRUMENTATION LOCATIONS

**RIGHT AND LEFT FORCES

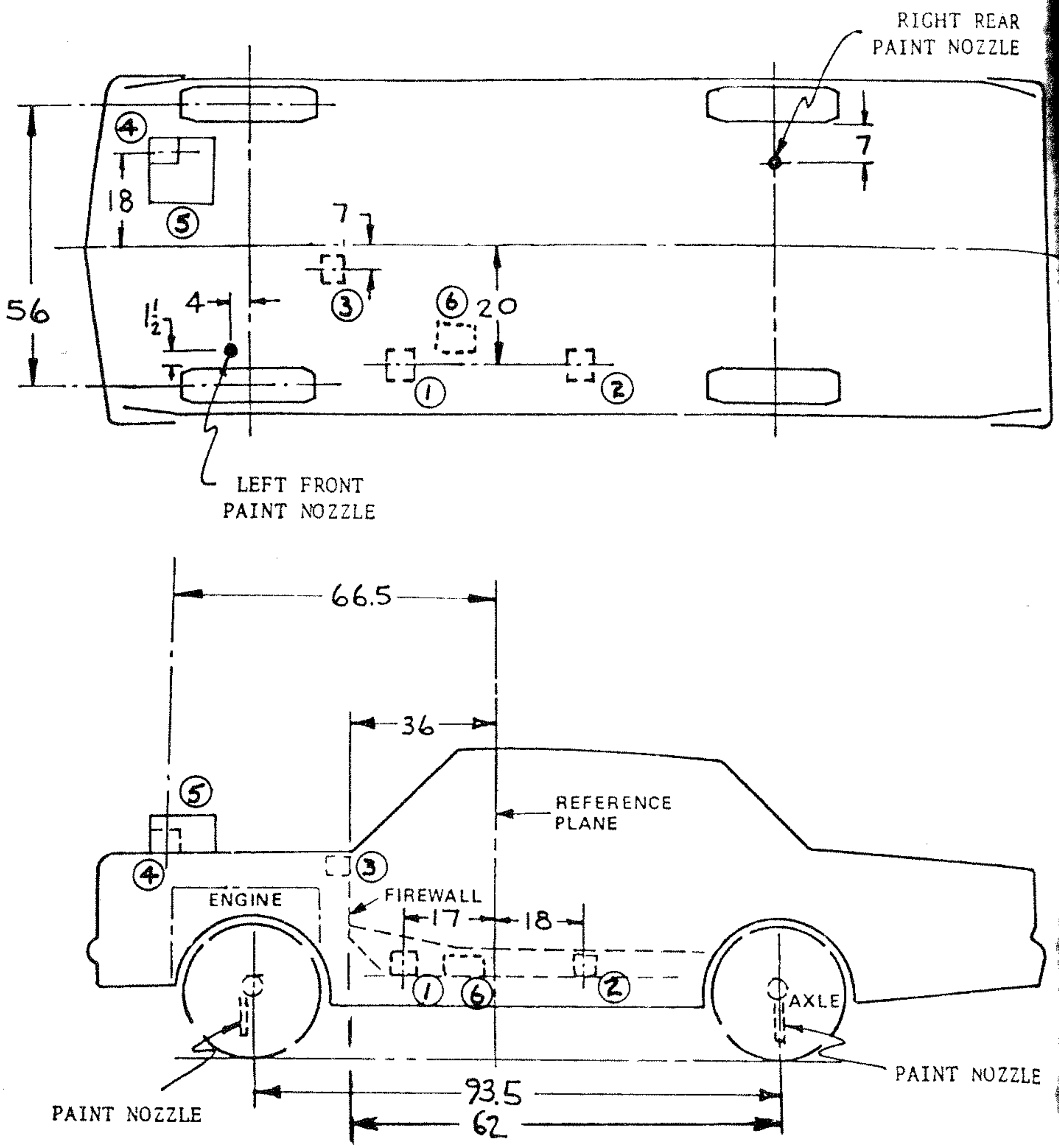


Figure 10-13 VEHICLE INSTRUMENTATION LOCATIONS

CAR 2 - 1974 FORD PINTO - TEST NO. 4

TABLE 10- 5

VEHICLE TEST WEIGHTS - TEST NO. 4

CAR 1 - 1974 Ford Torino

Left Front	1310 lbs.	Left Rear	1170 lbs.
Right Front	1310 lbs.	Right Rear	1190 lbs.
Total Front	2620 lbs.	Total Rear	2360 lbs.

Total Weight = 26.20 lbs. + 2360 lbs. = 4980 lbs.

Wheel Base 117.5 in.

Cg_{FW} = $\frac{2360 \text{ lbs.}}{4980 \text{ lbs.}}$ 117.5 in. = 55.68 in.

CAR 2 - 1974 Ford Pinto

Left Front	1040 lbs.	Left Rear	600 lbs.
Right Front	950 lbs.	Right Rear	600 lbs.
Total Front	1990 lbs.	Total Rear	1200 lbs.

Total Weight = 1990 lbs. + 1200 lbs. = 3190 lbs.

Wheel Base 95 in.

Cg_{FW} = $\frac{1200 \text{ lbs.}}{3190 \text{ lbs.}}$ 95 in. = 35.73 in.

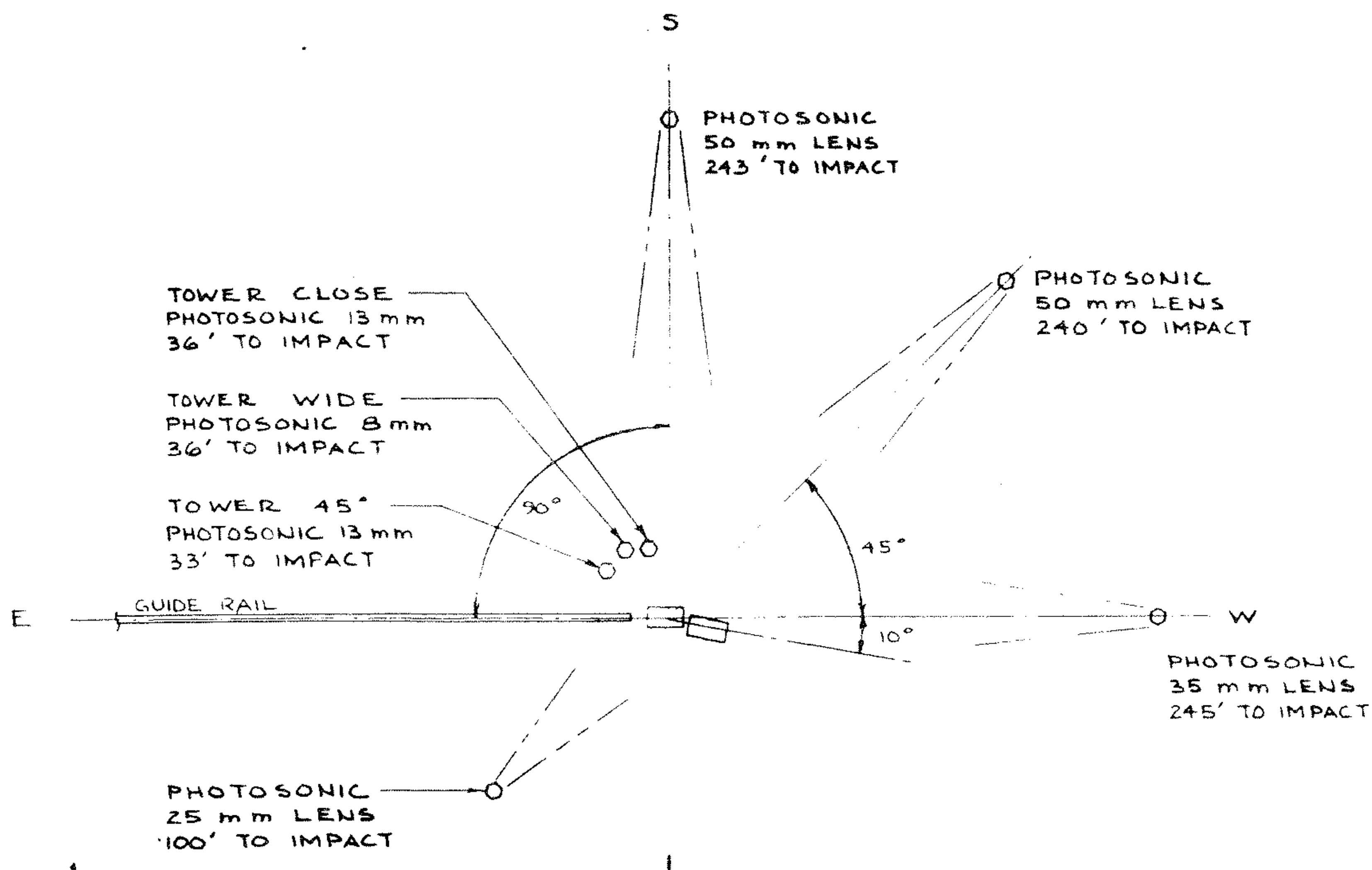


Figure 10-14
STAGED COLLISION SCENE
& CAMERA LOCATIONS
TESTS 3, 4 & 5

TABLE 10-6

HIGH SPEED CAMERA INFORMATION (TEST No. 4)

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	NORTH EAST	PHOTOSONIC	25 MM	900
2	SOUTH	PHOTOSONIC	50 MM	1000
3	SOUTH WEST	PHOTOSONIC	50 MM	625
4	WEST	PHOTOSONIC	35 MM	800
5	TOWER 45	PHOTOSONIC	13 MM	800
6	TOWER WIDE	PHOTOSONIC	8 MM	600
7	TOWER CLOSE	PHOTOSONIC	13 MM	600
8	O.B. DRIVER	STALEX	8 MM	900
9	O.B. HOOD	STALEX	8 MM	NO PULSE
10	O.B. PASS.	STALEX	8 MM	1050

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.

(24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH AND CRASH EVENT SPLICED AT START AND END OF FILM.

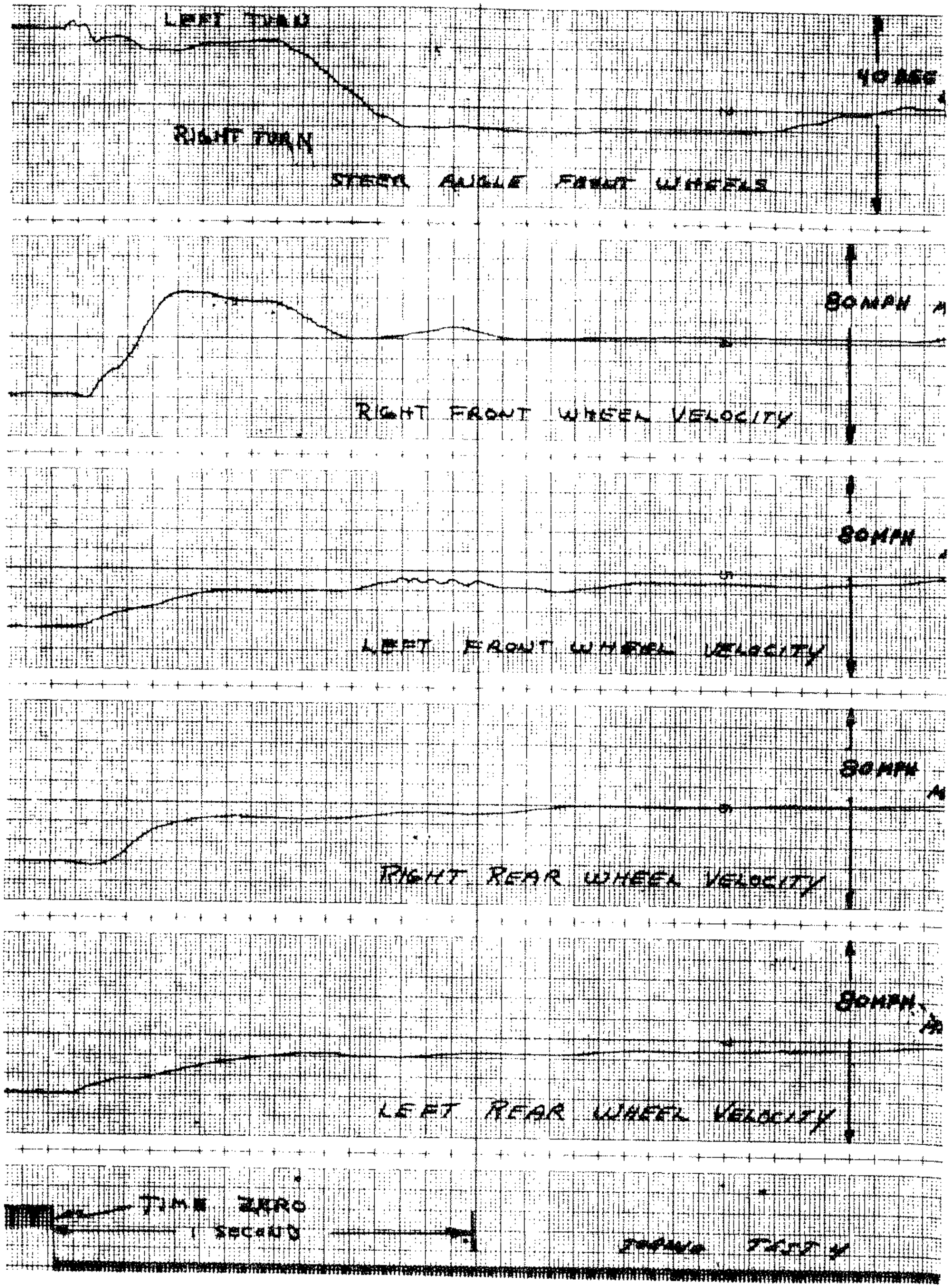


Figure 10-15 TEST NO. 4
CAR NO. 1 WHEEL RESPONSES

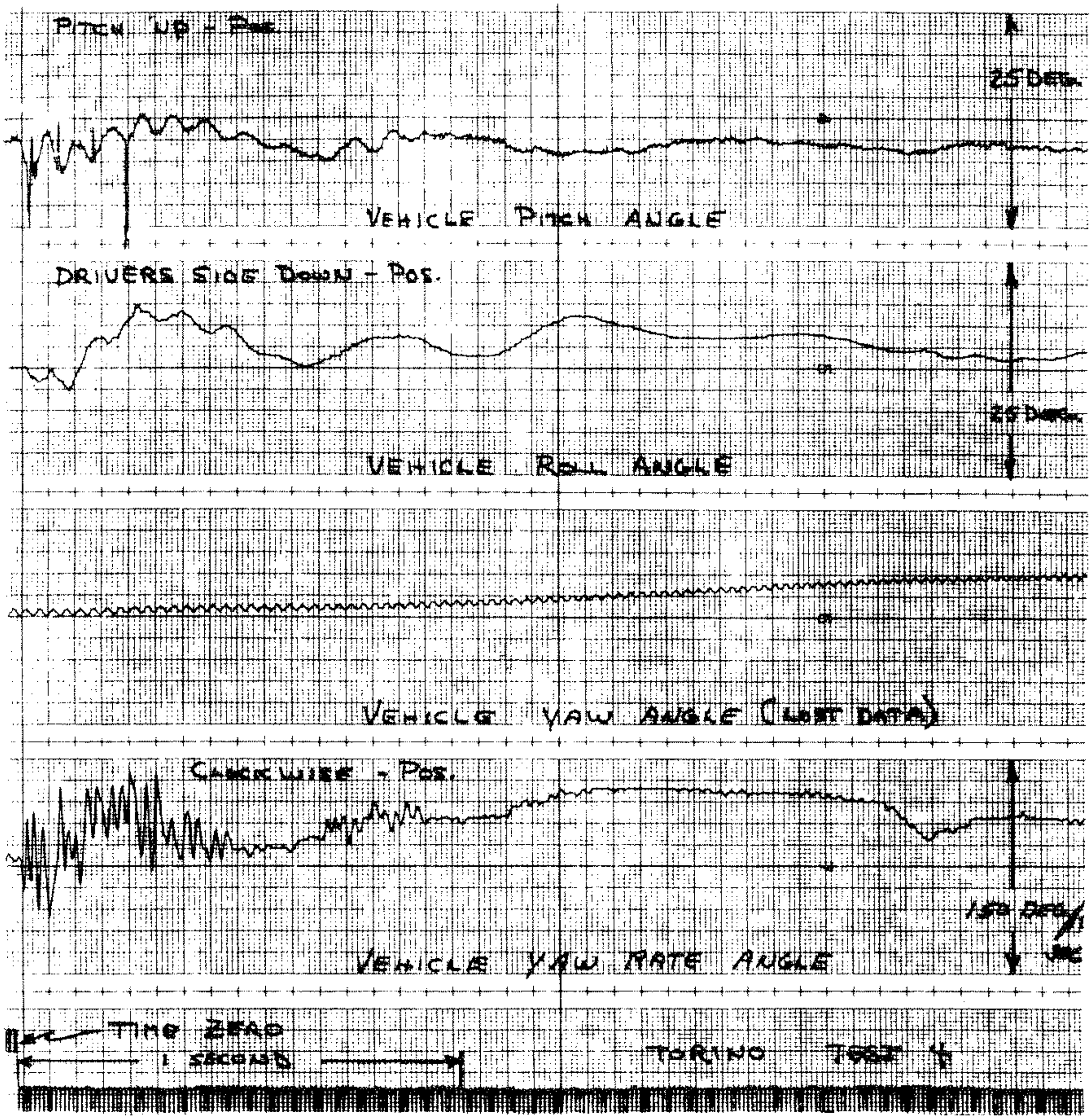


Figure 10-16 TEST NO. 4
CAR NO. 1 VEHICLE ATTITUDE

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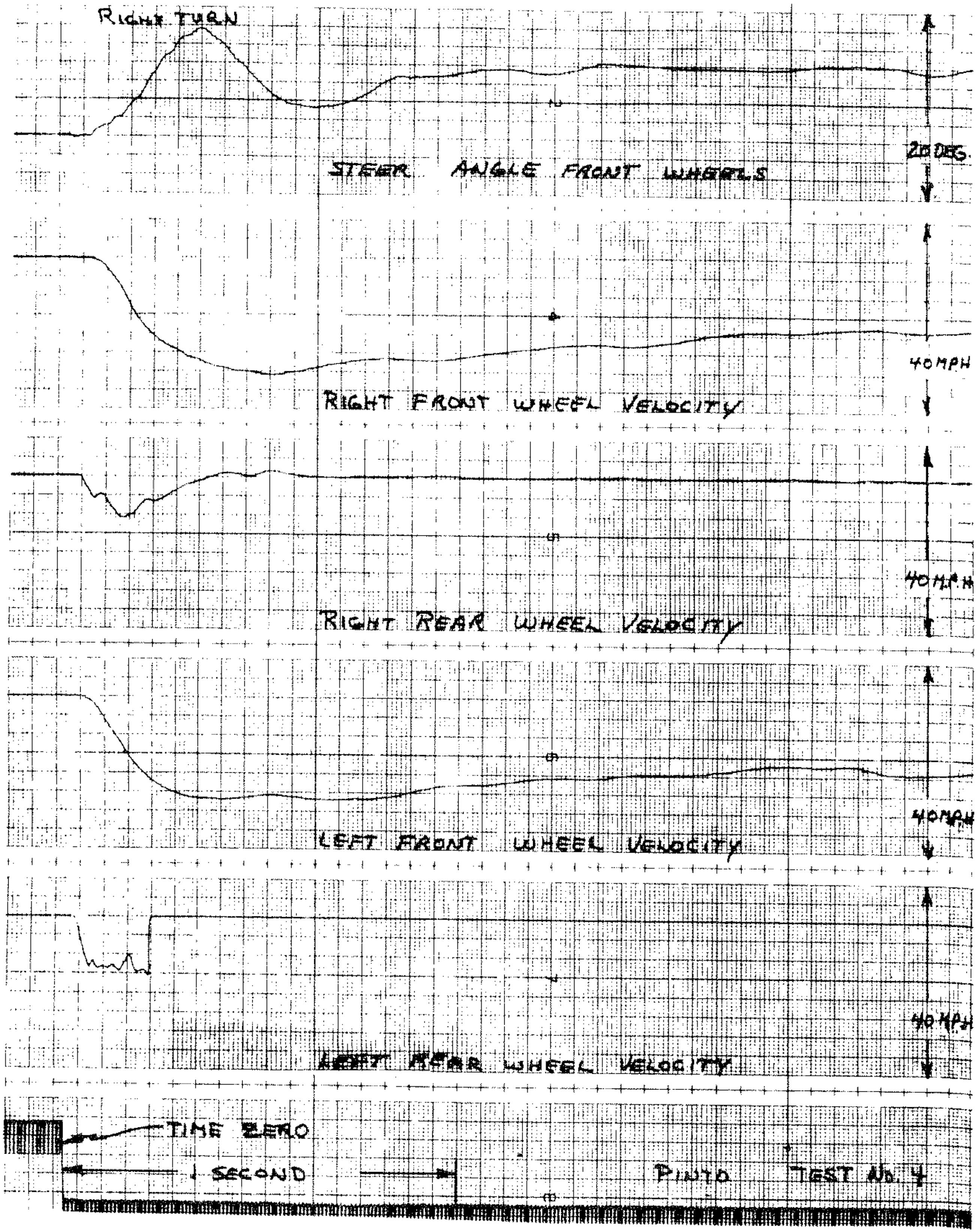

Figure 10-17 TEST NO. 4
CAR NO. 2 WHEEL RESPONSES

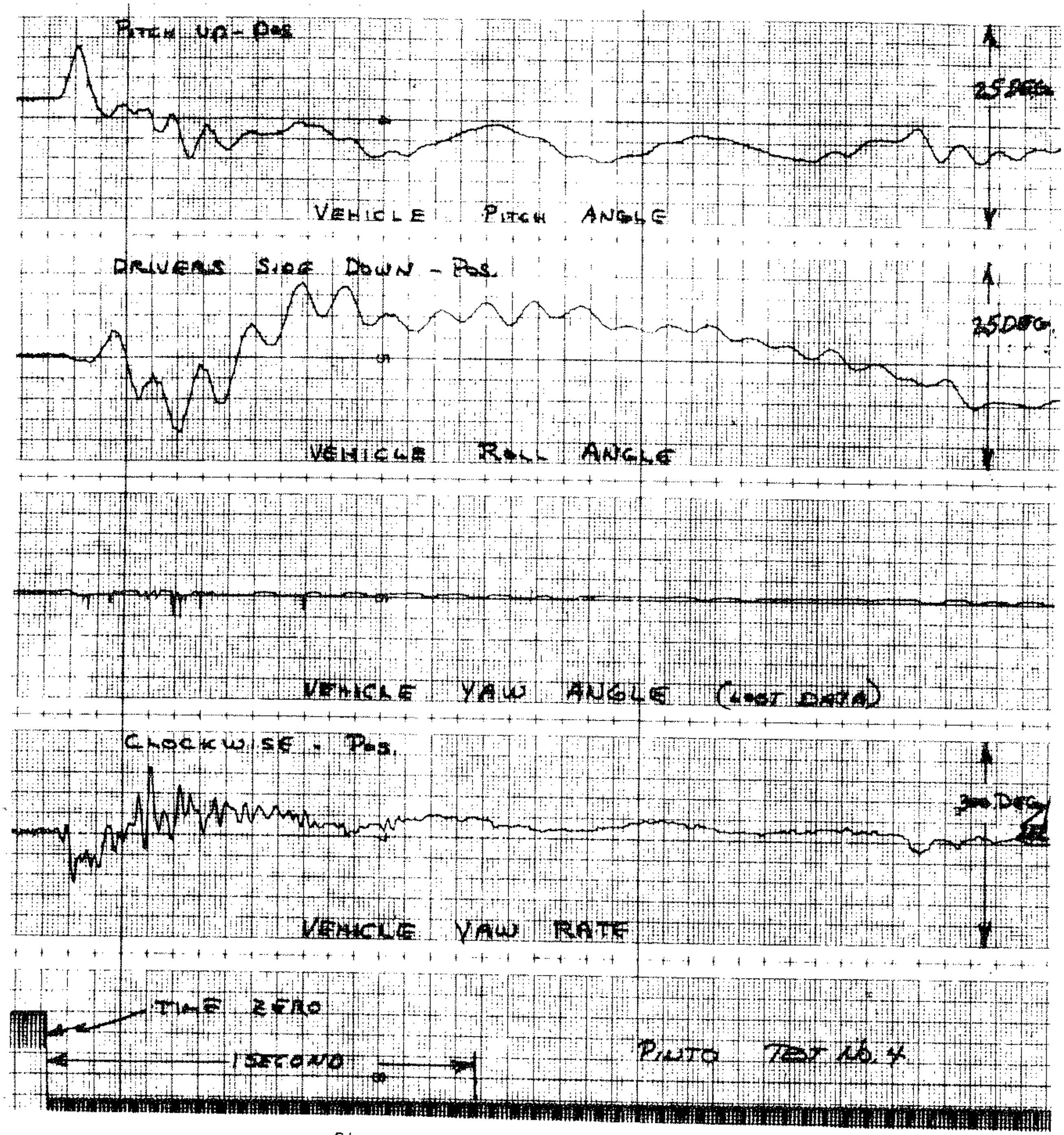

Figure 10-18 TEST NO. 4 - CAR NO. 2
VEHICLE ATTITUDE

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RICSAC TEST NO. 4

VEHICLE RESPONSES

CAR NO. 1 TORINO

DATA PLOTS

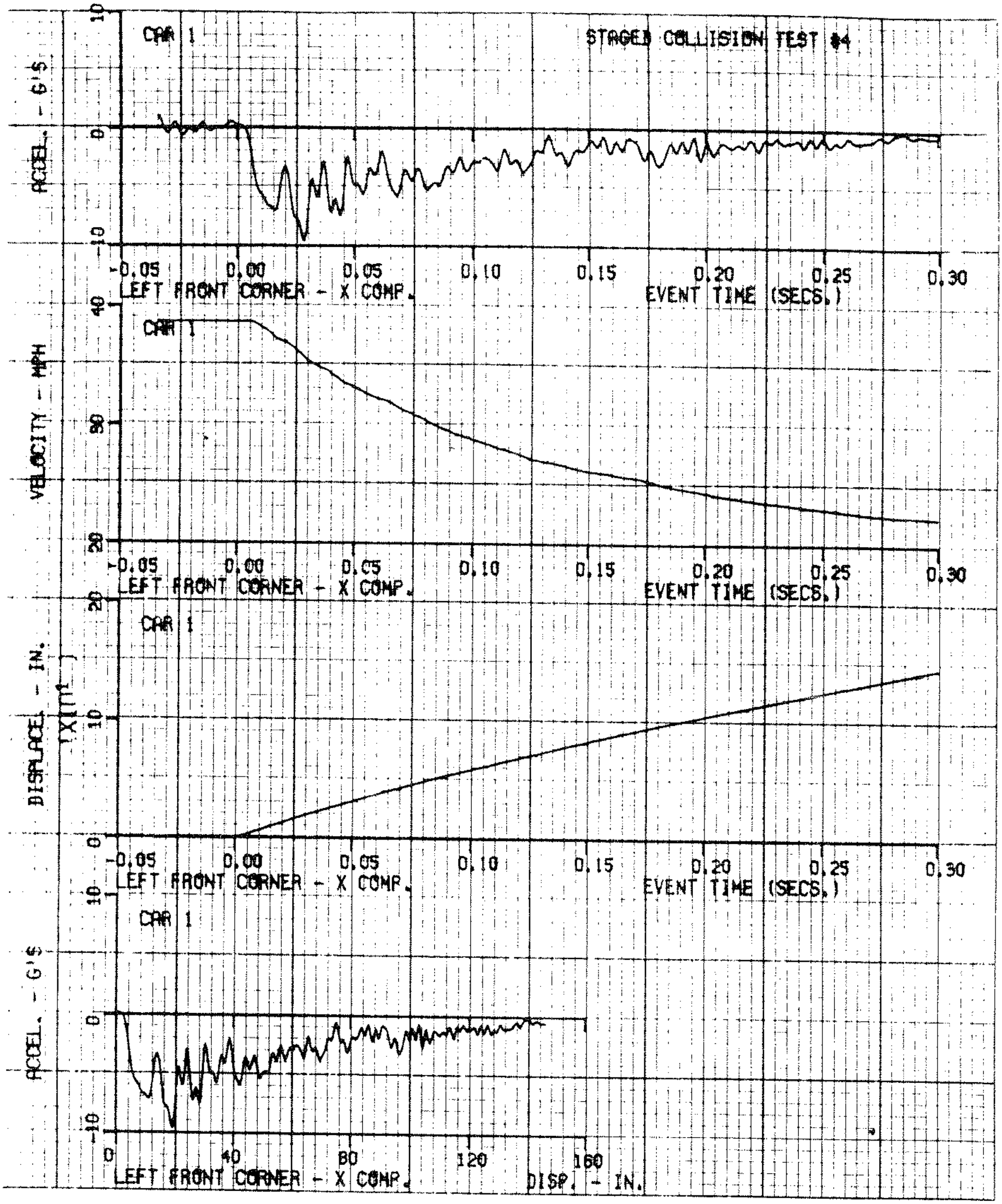
ACCELERATION TIME HISTORIES

VELOCITY TIME HISTORIES

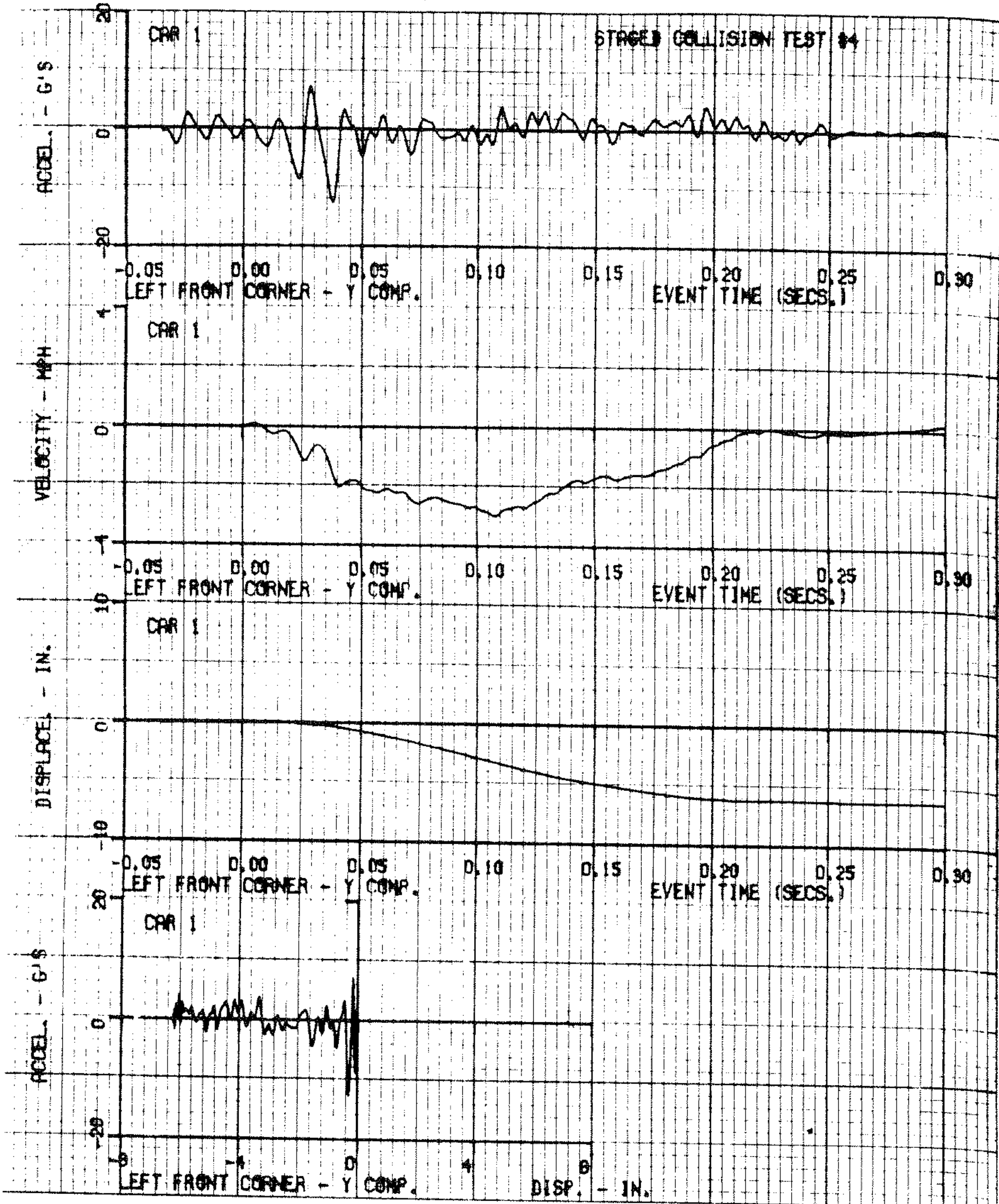
DISPLACEMENT TIME HISTORIES

ACCELERATION VS DISPLACEMENT

FILTER CLASS 60



CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
30
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
40
80
120
160
LEFT FRONT CORNER - X COMP.
DISP. - IN.


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
20
0
-20
-8
-4
0
4
8
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

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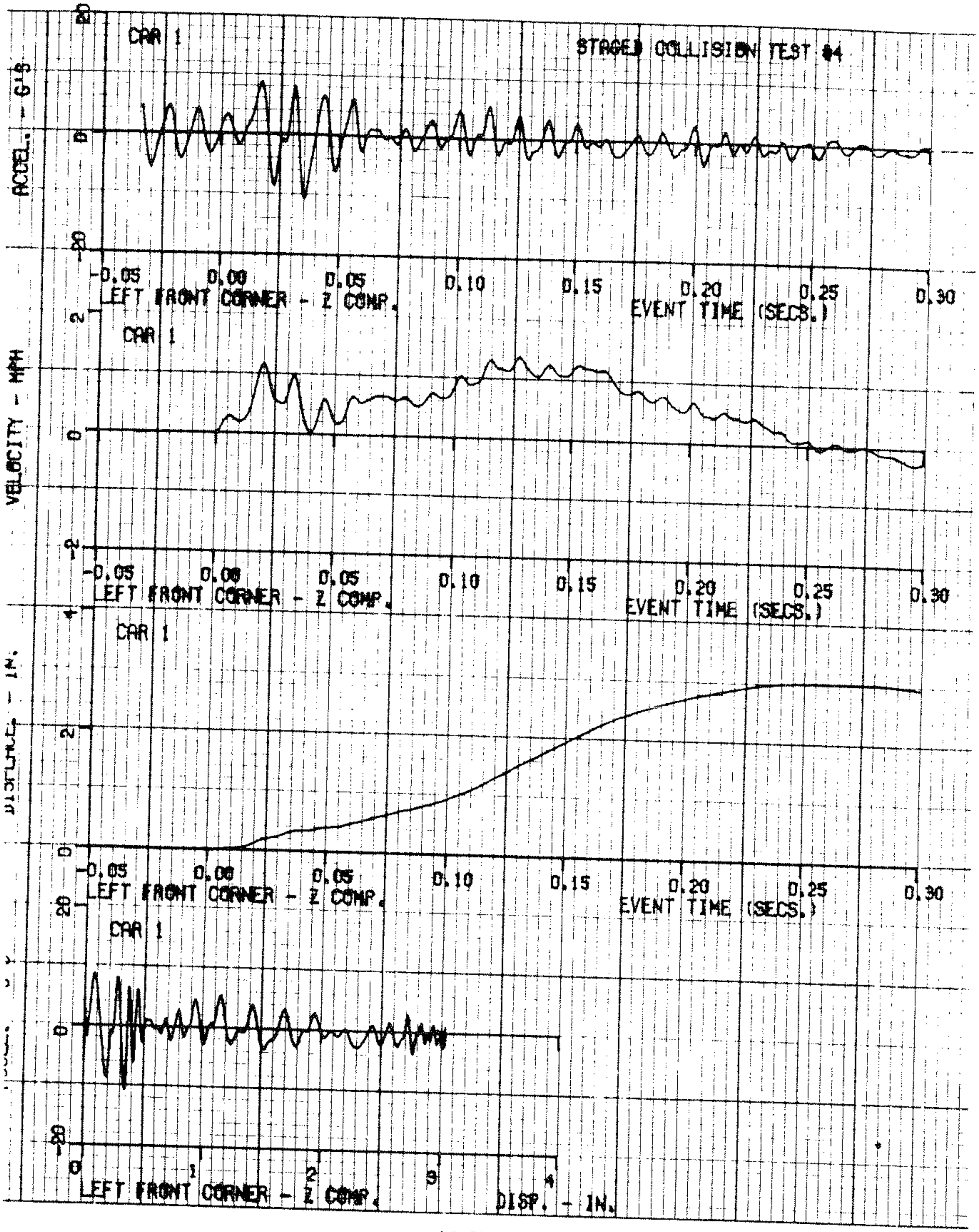
CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
4
2
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
20
0
-20
0
1
2
3
4
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

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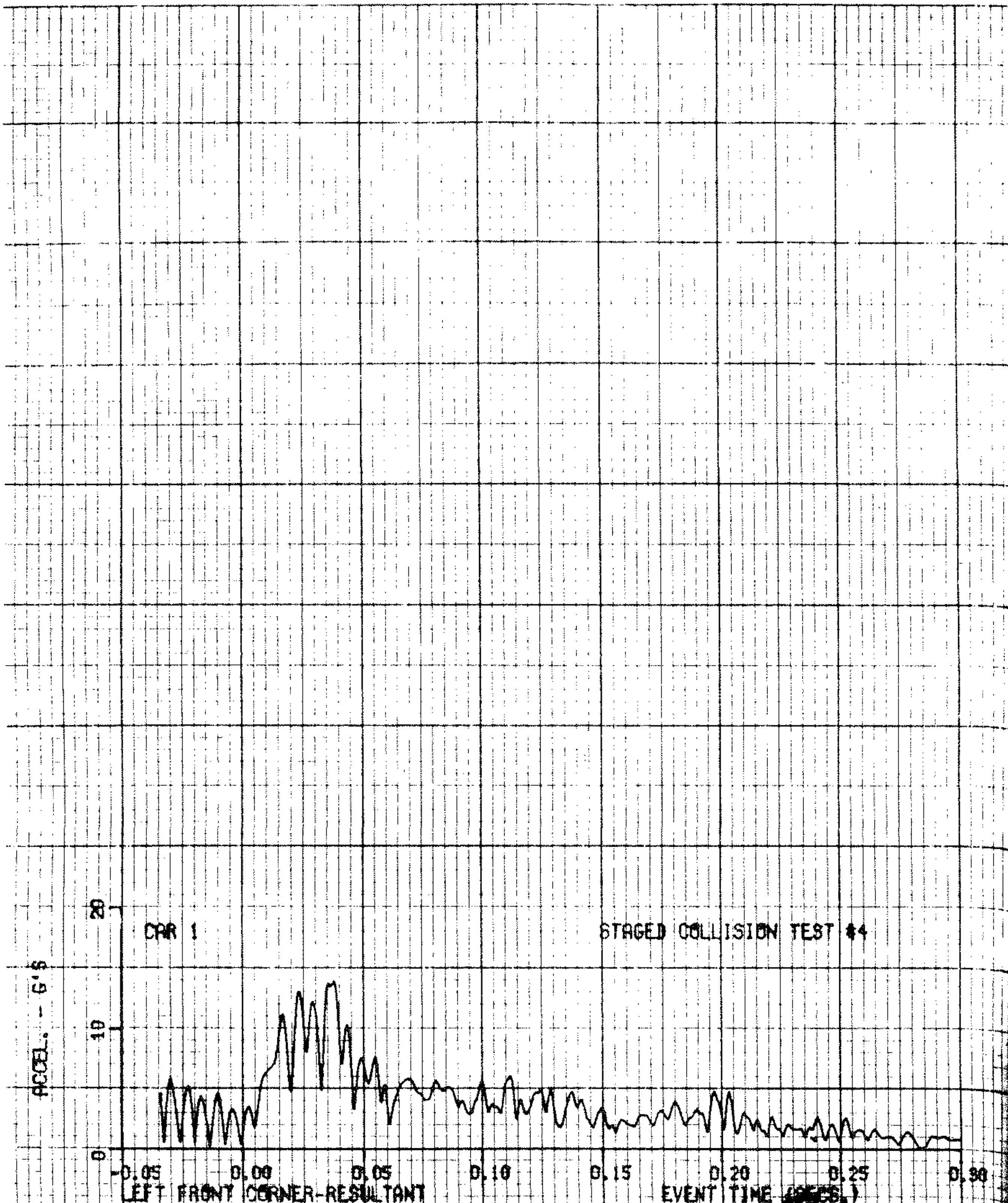
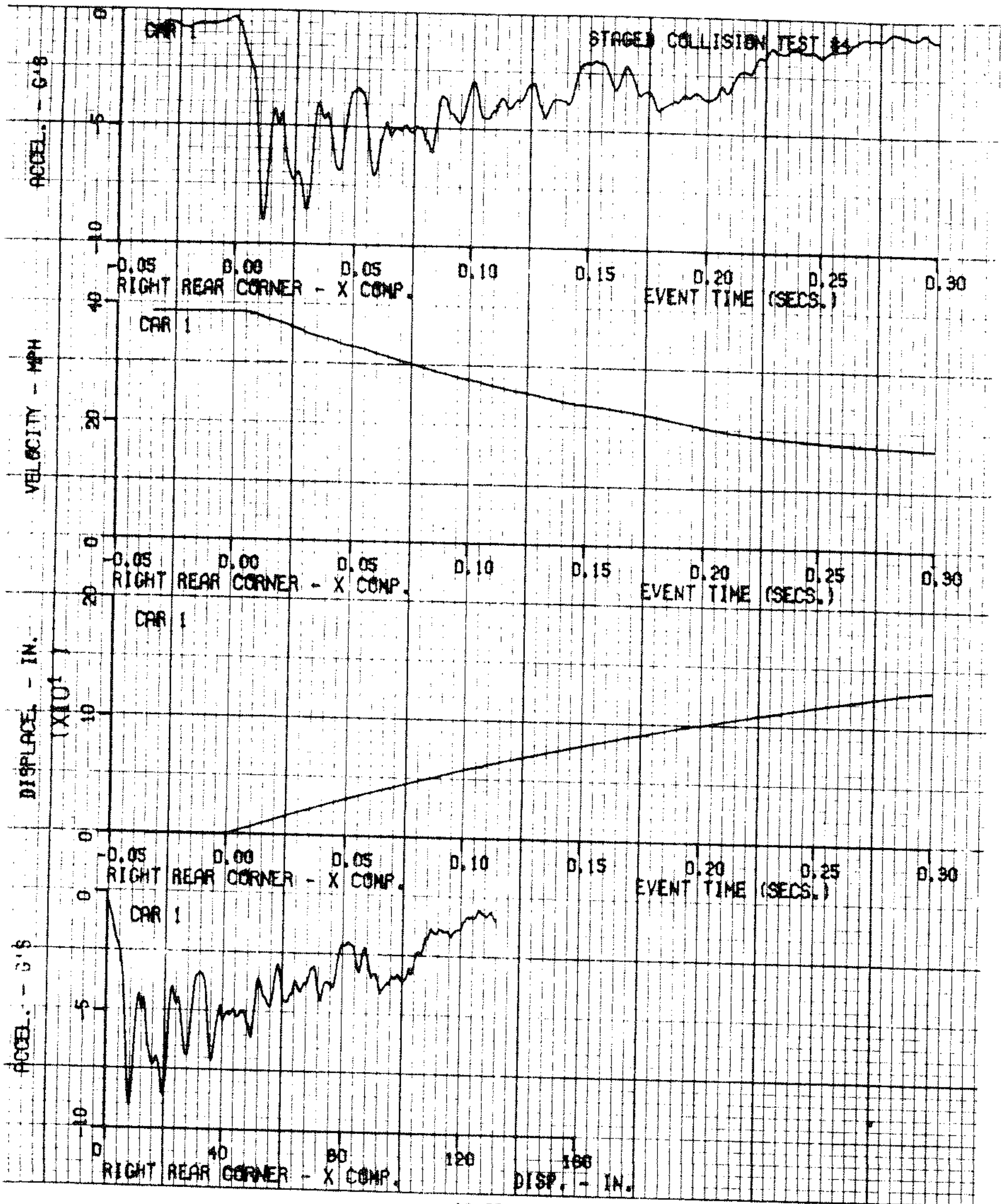
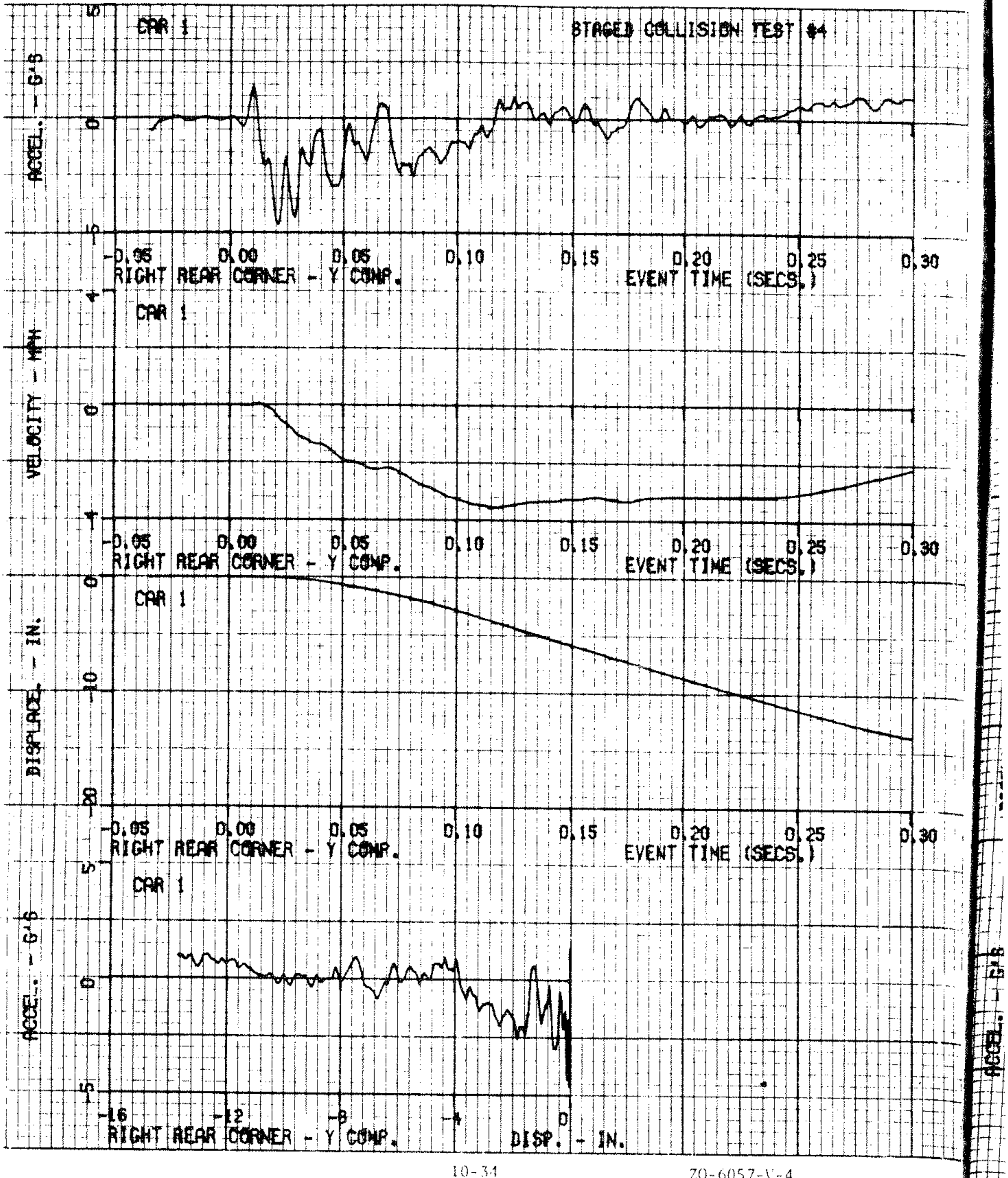
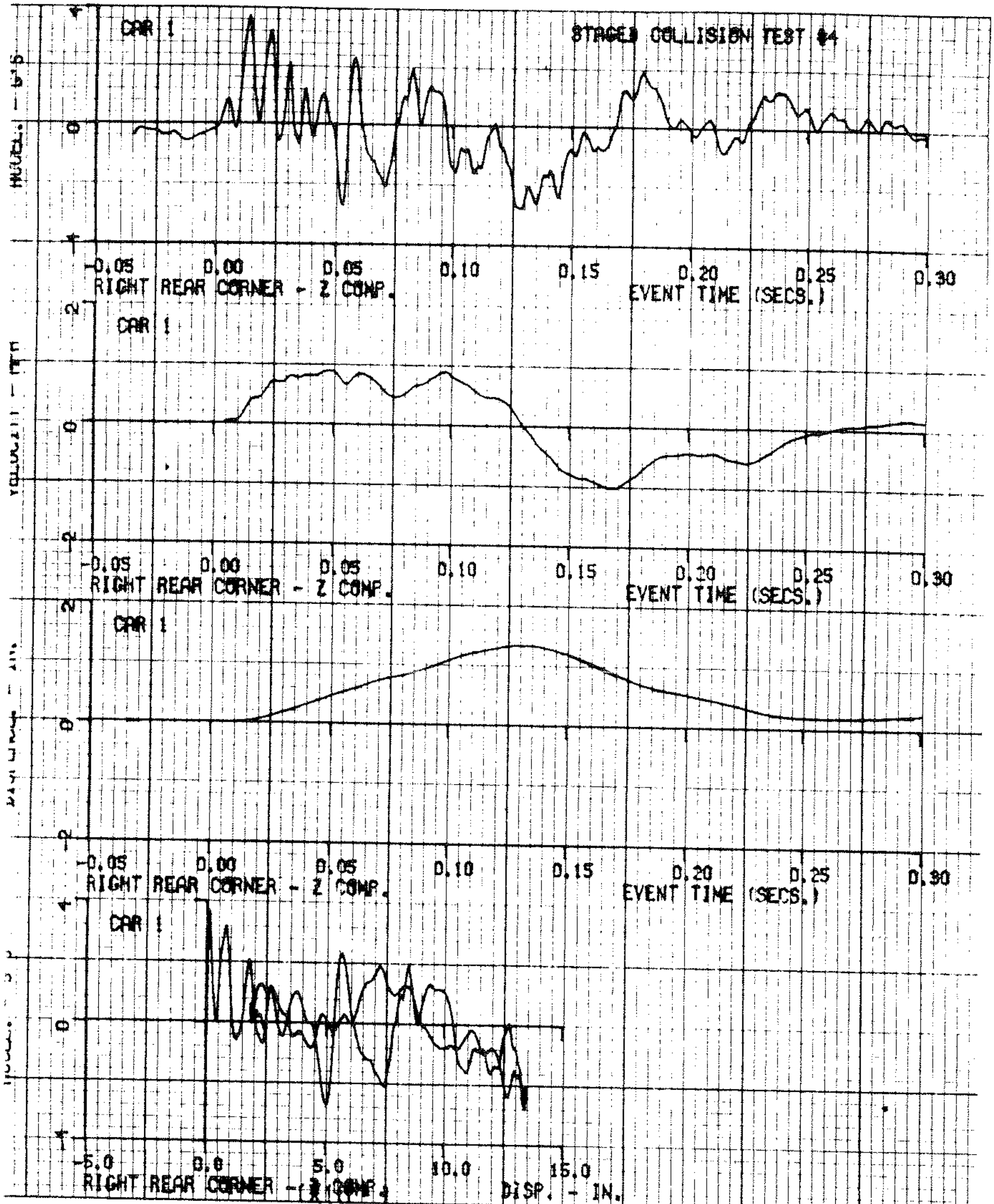

CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
0
10
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME

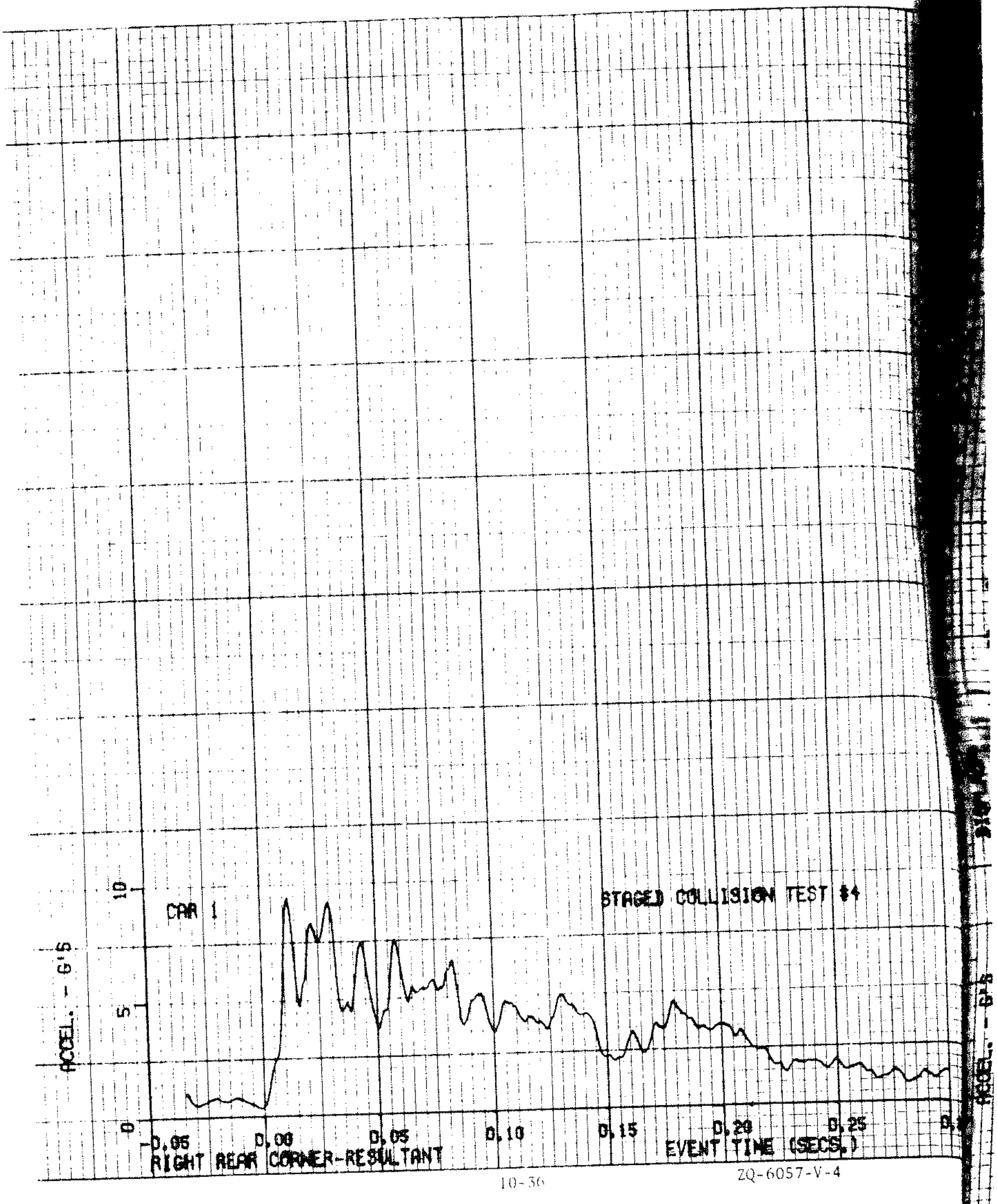

STAGED COLLISION TEST #4
CAR 1
ACCEL. - G'S
0
-5
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
20
0
DISPLACE. - IN.
(X10¹)
20
10
RIGHT REAR CORNER - X COMP.
0
40
80
120
160
DISP. - IN.


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
5
0
-5
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-10
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
5
0
-5
-16 -12 -8 -4 0
RIGHT REAR CORNER - Y COMP.
DISP. - IN.

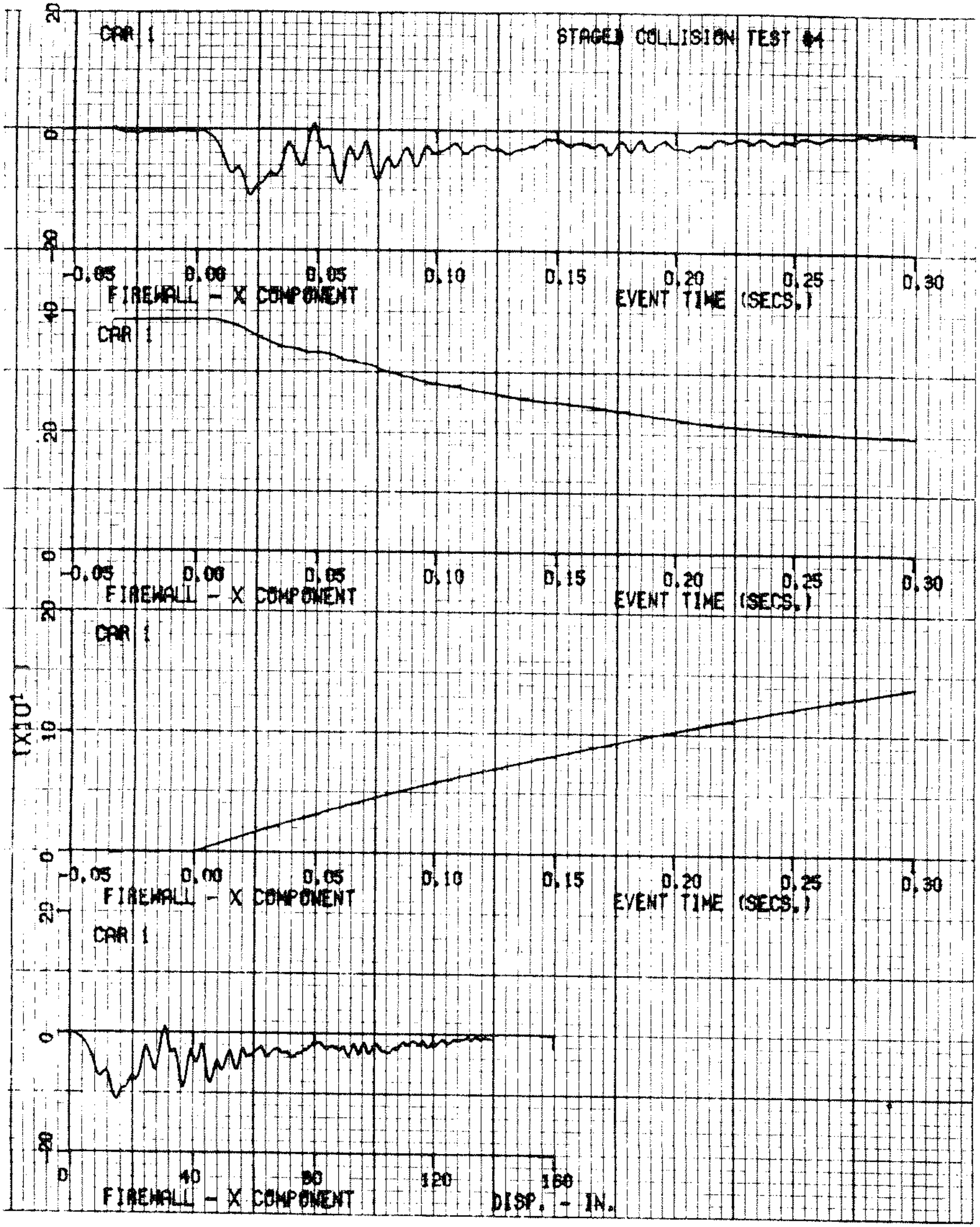
ZQ-6057-V-4

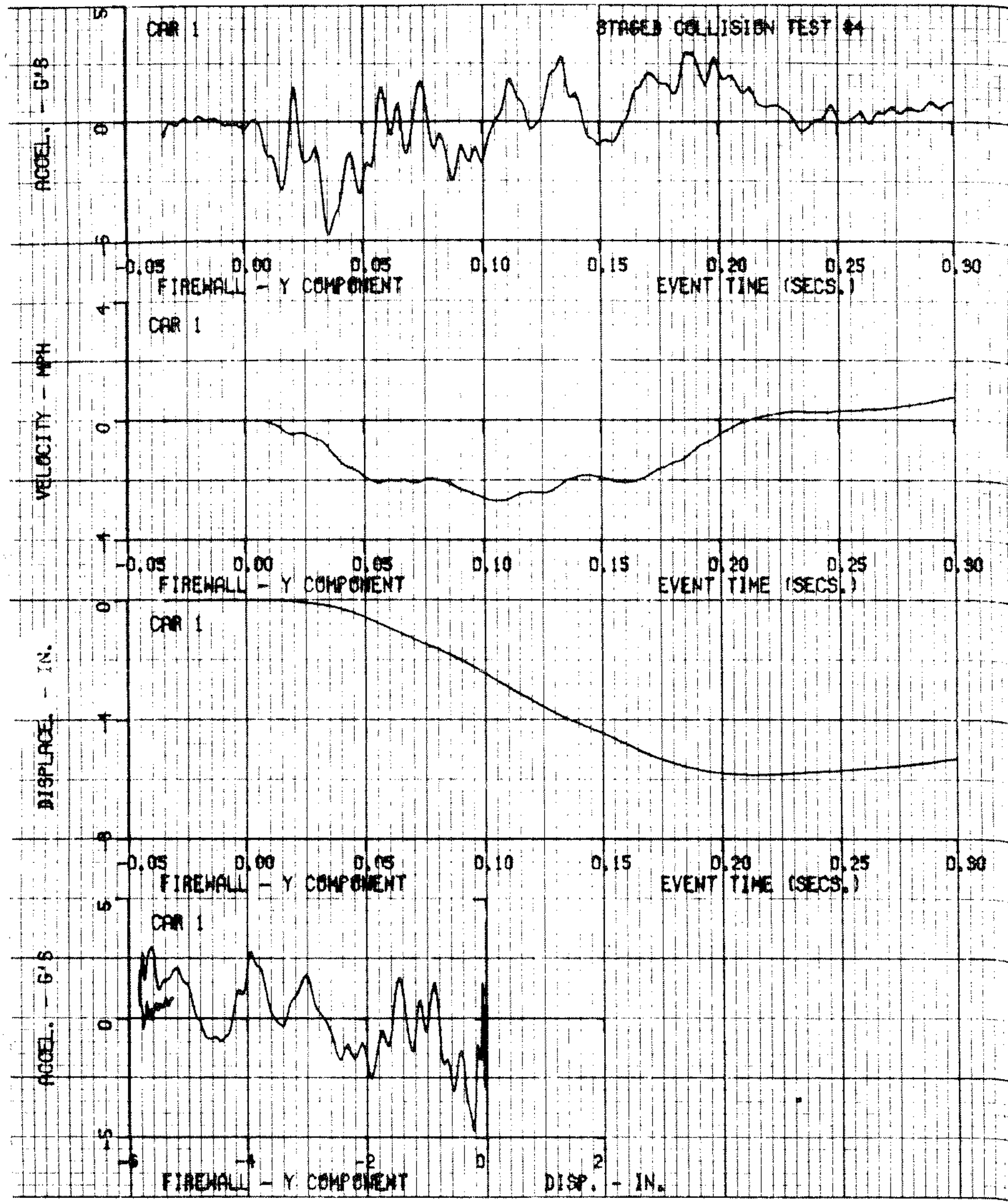

CAR 1
STAGED COLLISION TEST #4
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
RIGHT REAR CORNER - Z COMP.
DISP. - IN.

ZQ-6057-V-4

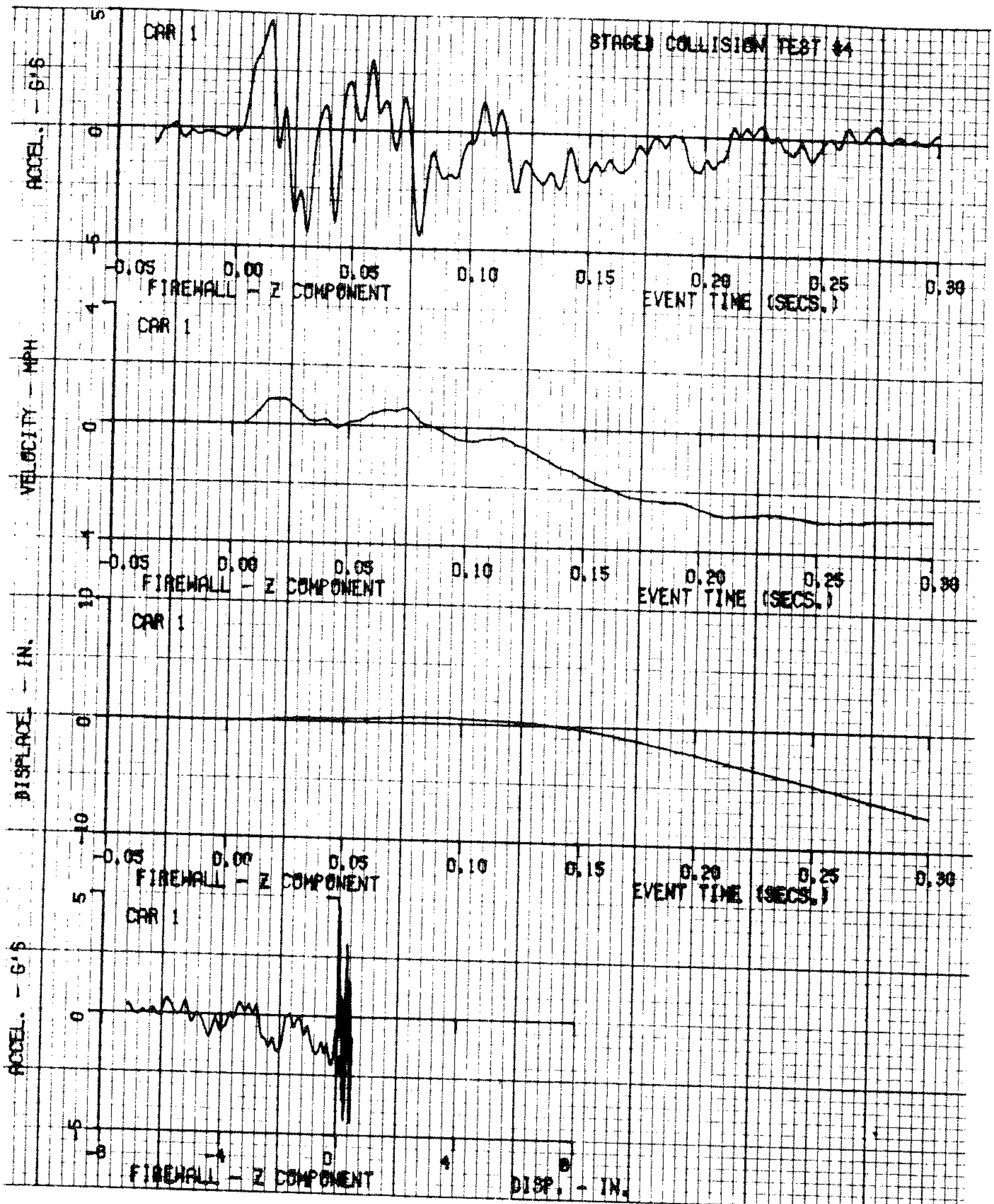

CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
10
5
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
EVENT TIME (SECS.)
RIGHT REAR CORNER-RESULTANT

ZQ-6057-V-4

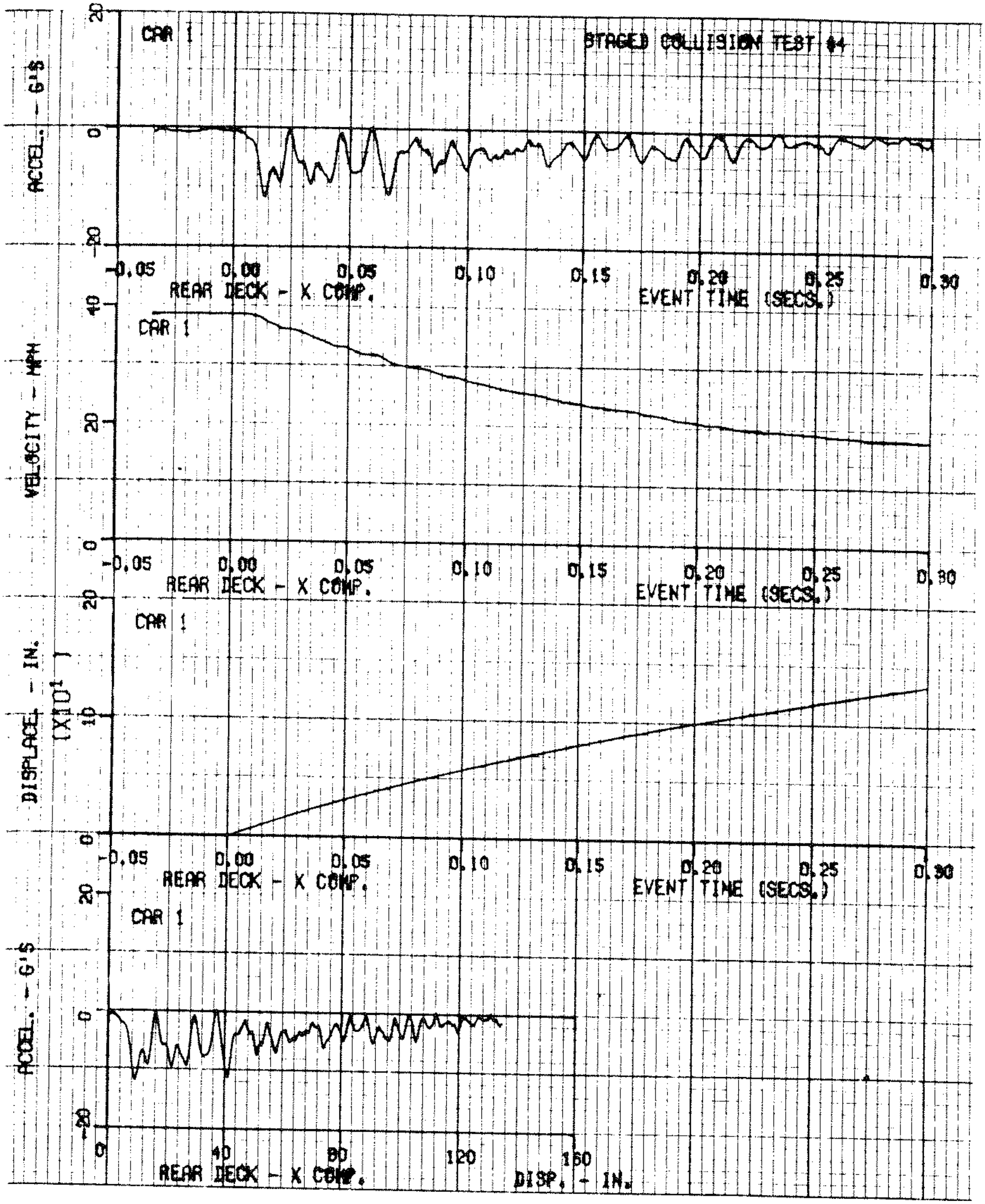

CAR 1
STAGED COLLISION TEST #4
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
20
CAR 1
[X10^1]
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
20
CAR 1
0
-20
0
40
80
120
160
FIREWALL - X COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
FIREWALL - Y COMPONENT
DISP. - IN.

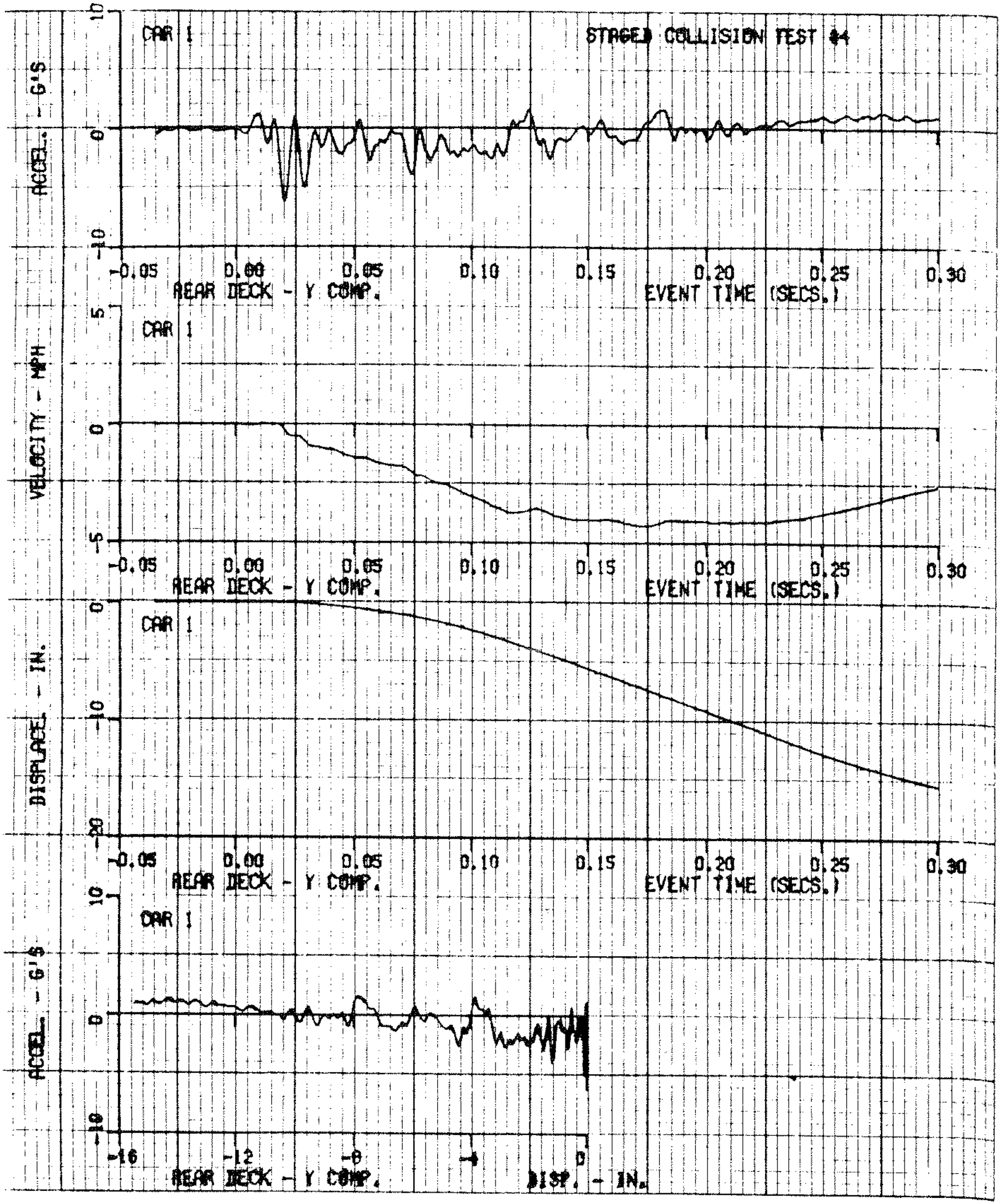
ZQ-6057-V-4


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
FIREWALL - Z COMPONENT
DISP. - IN.

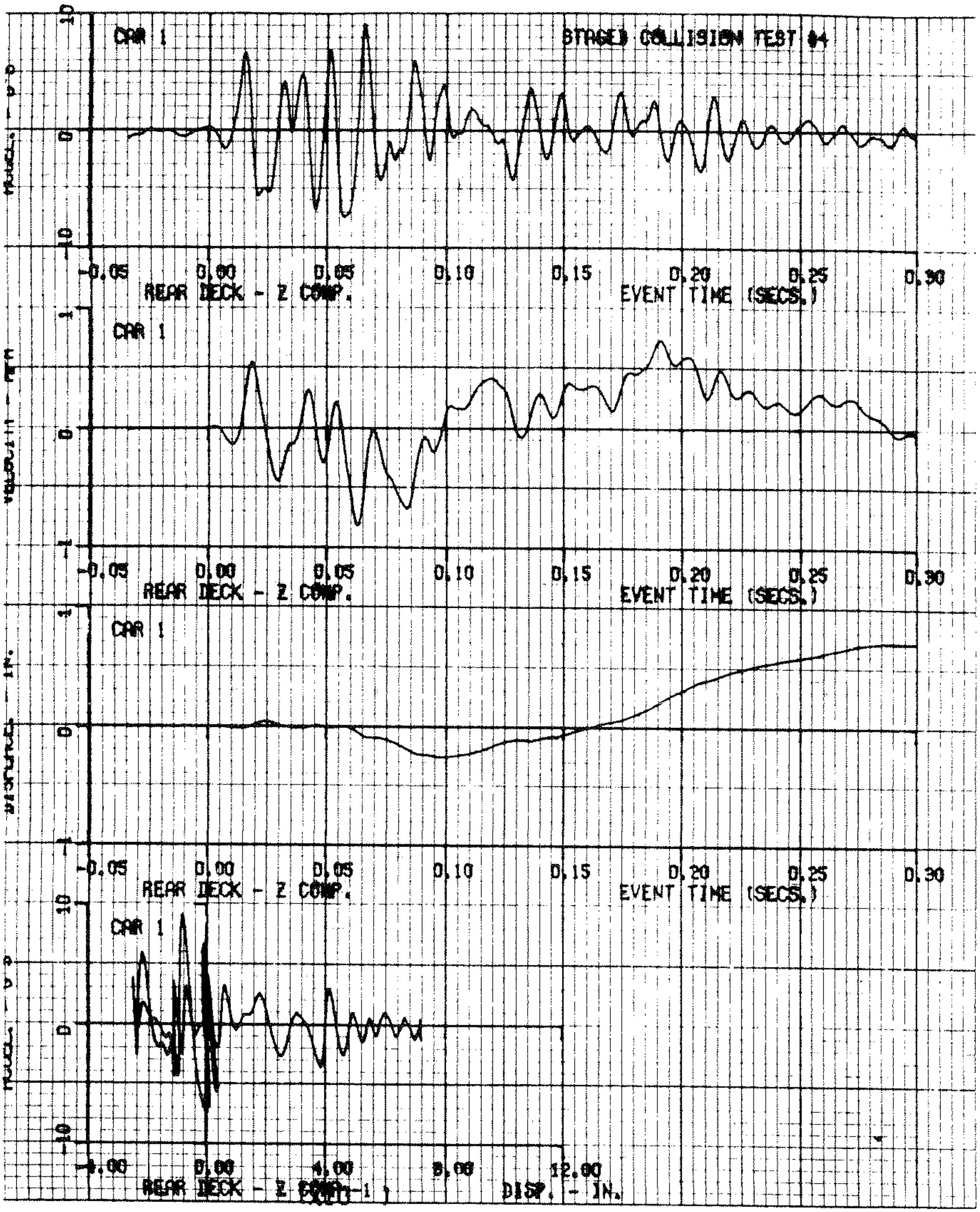
ZQ-6057-V-4

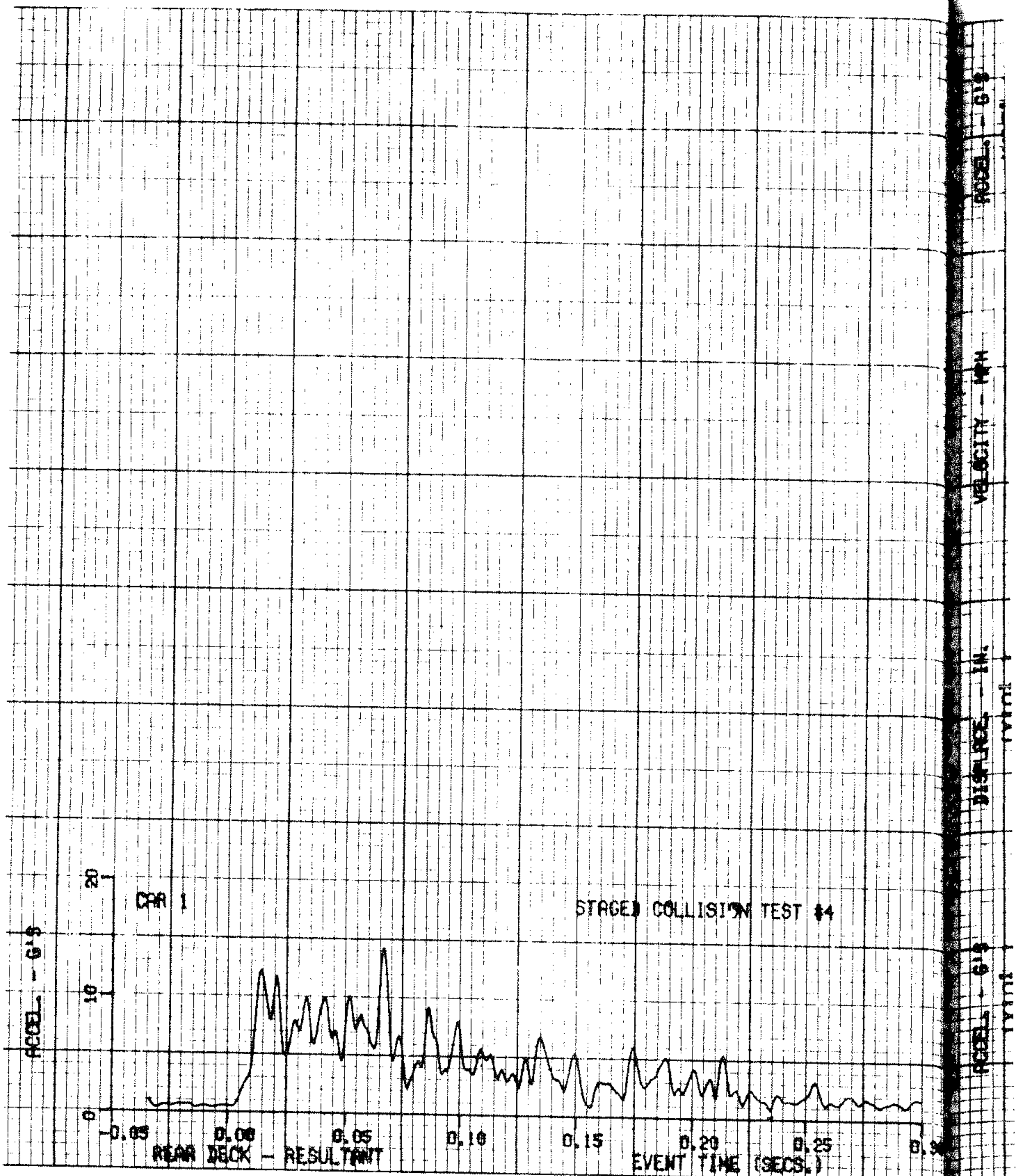

CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
20
0
CAR 1
DISPLACE. - IN.
[X10^1]
20
10
0
CAR 1
ACCEL. - G'S
0
40
80
120
160
DISP. - IN.

ZQ-6057-V-4

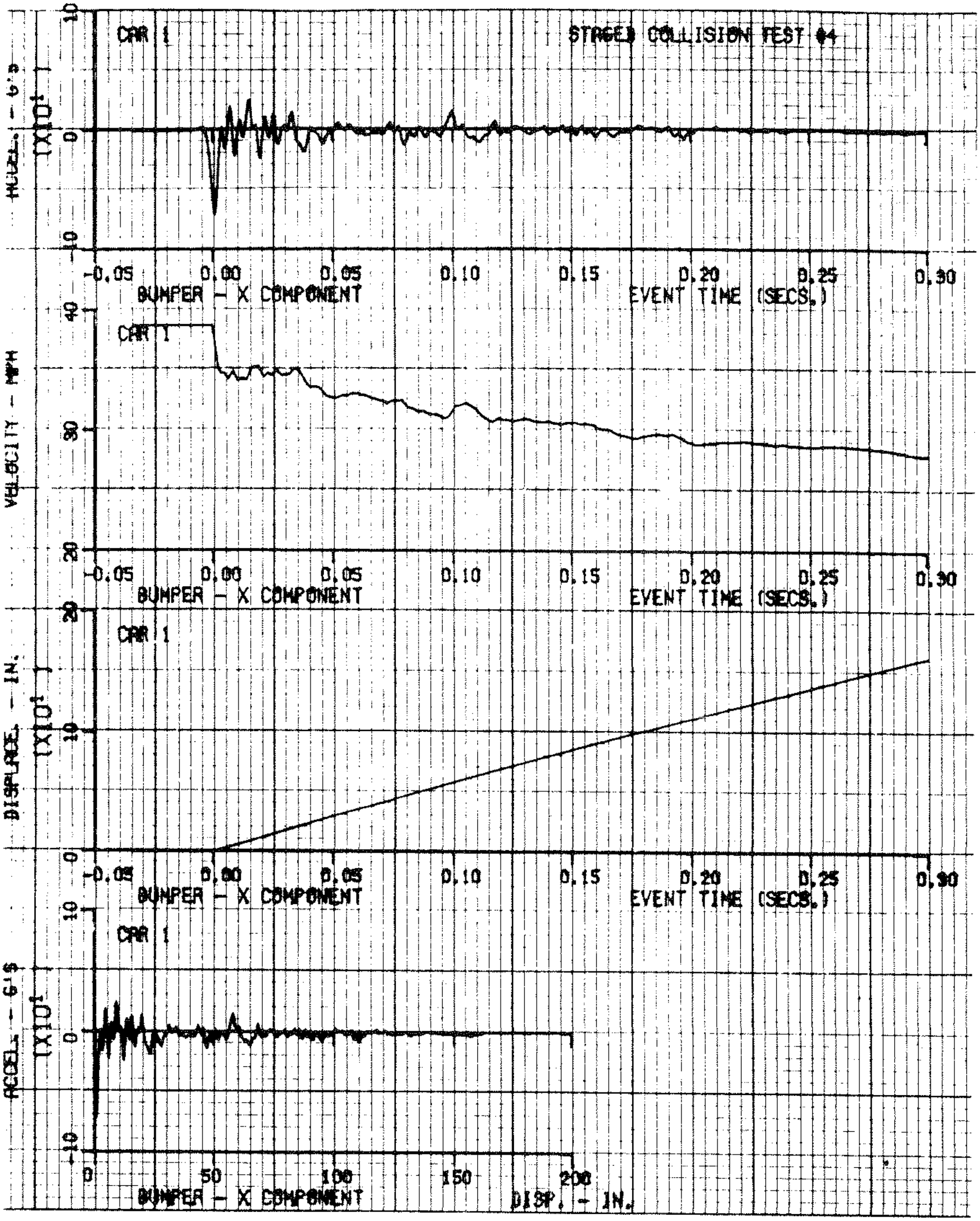

CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-10
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-16
-12
-8
-4
0
REAR DECK - Y COMP.
DISP. - IN.

ZQ-6057-V-4


CAR 1
STAGED COLLISION TEST #4
REAR DECK - Z COMP.
EVENT TIME (SECS.)
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DISP. - IN.


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)
ACCEL. - G'S
VELOCITY - MPH
DISPLACE. - IN.
ACCEL. - G'S

ZQ-6057-V-4


CAR 1
STAGED COLLISION TEST #4
ACCEL. - G'S
[X10¹]
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
30
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
[X10¹]
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
[X10¹]
10
0
-10
0
50
100
150
200
BUMPER - X COMPONENT
DISP. - IN.

RICSAC TEST NO. 4

VEHICLE RESPONSES

VEHICLE NO. 2 PINTO

DATA PLOTS

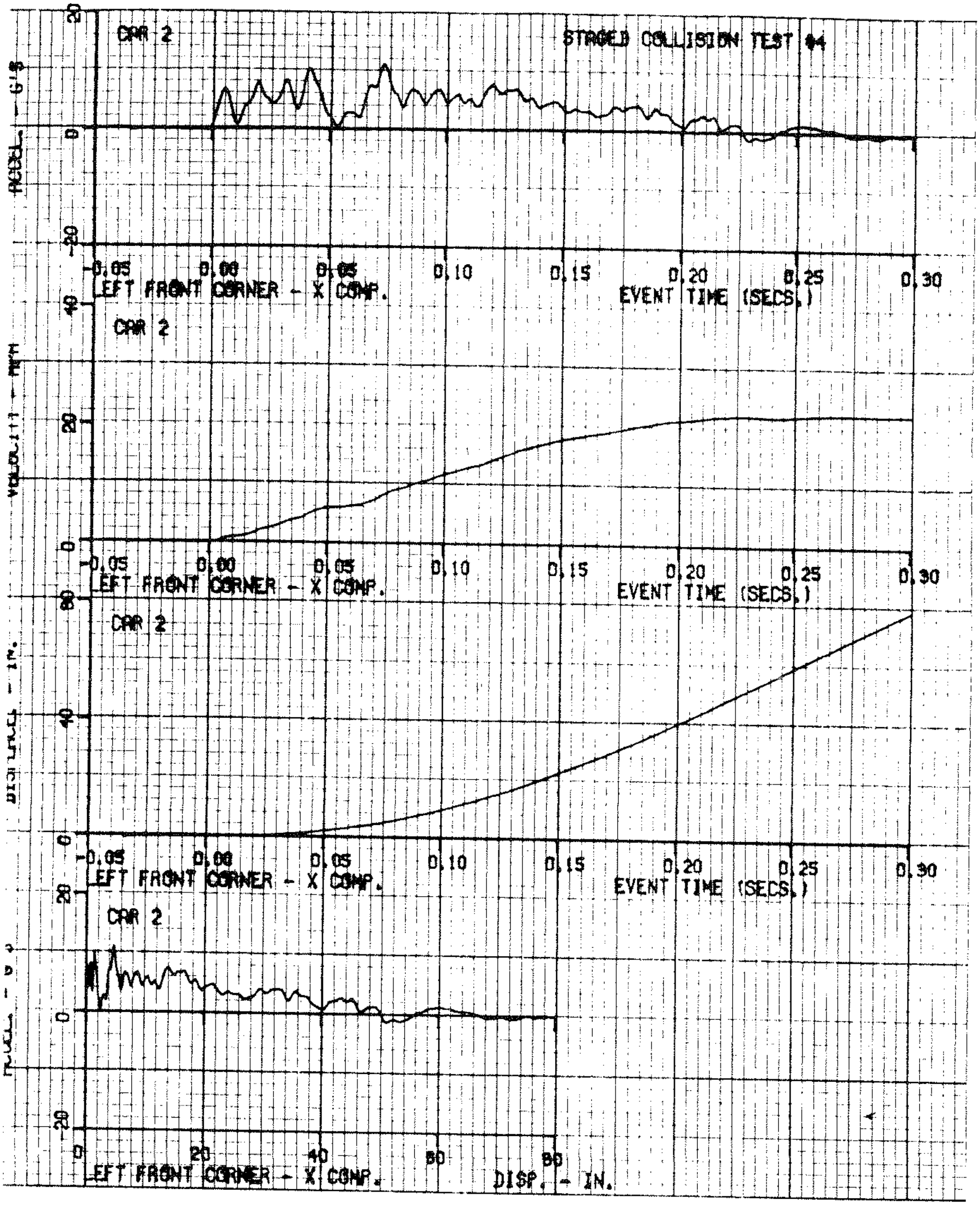
ACCELERATION TIME HISTORIES

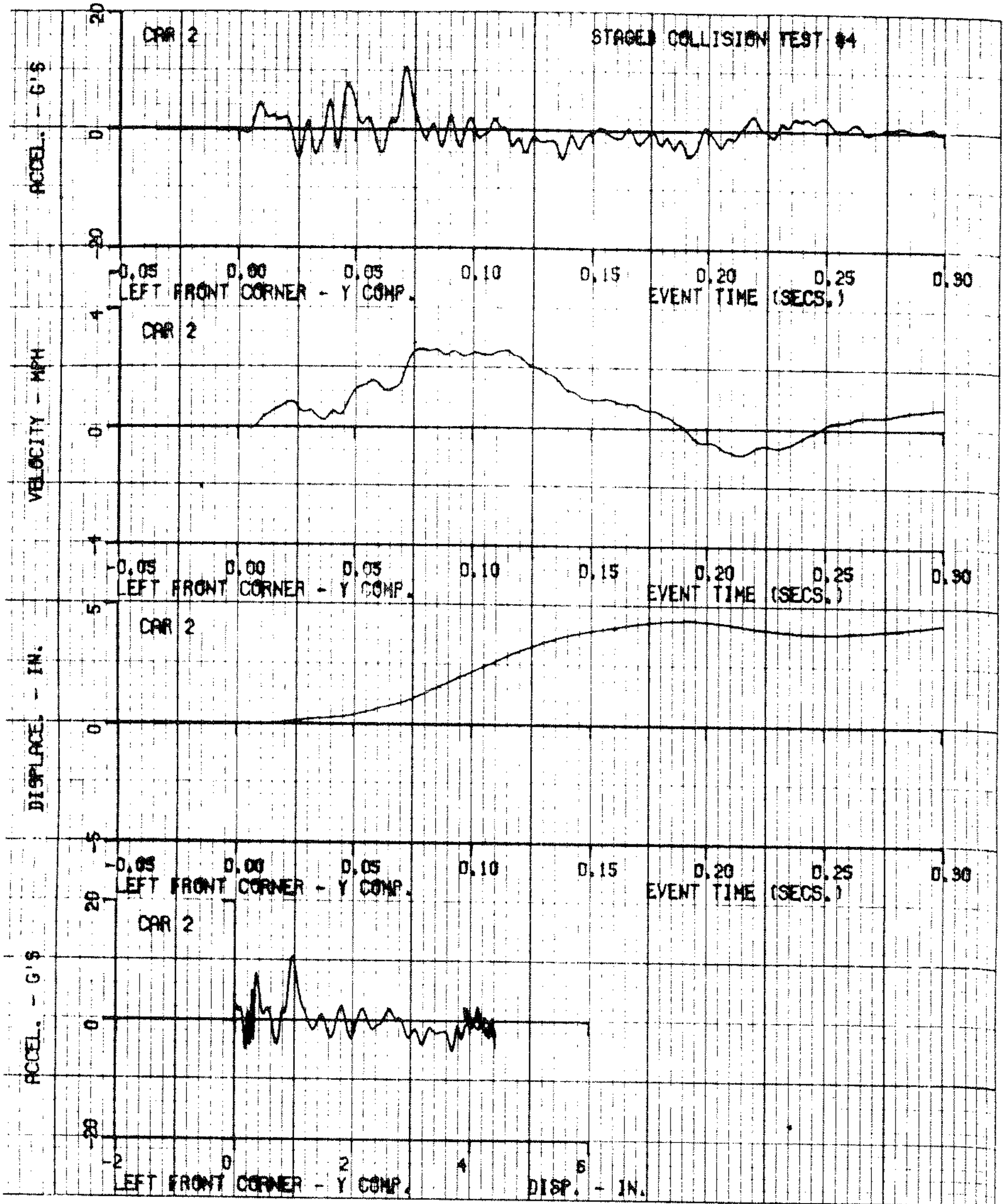
VELOCITY TIME HISTORIES

DISPLACEMENT TIME HISTORIES

ACCELERATION VS DISPLACEMENT

FILTER CLASS 60


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
DISTANCE - IN.
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
LEFT FRONT CORNER - X COMP.
DISP. - IN.


STAGED COLLISION TEST #4
CAR 2
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
4
0
-4
DISPLACE. - IN.
5
-5
DISP. - IN.
-2
2
4
6

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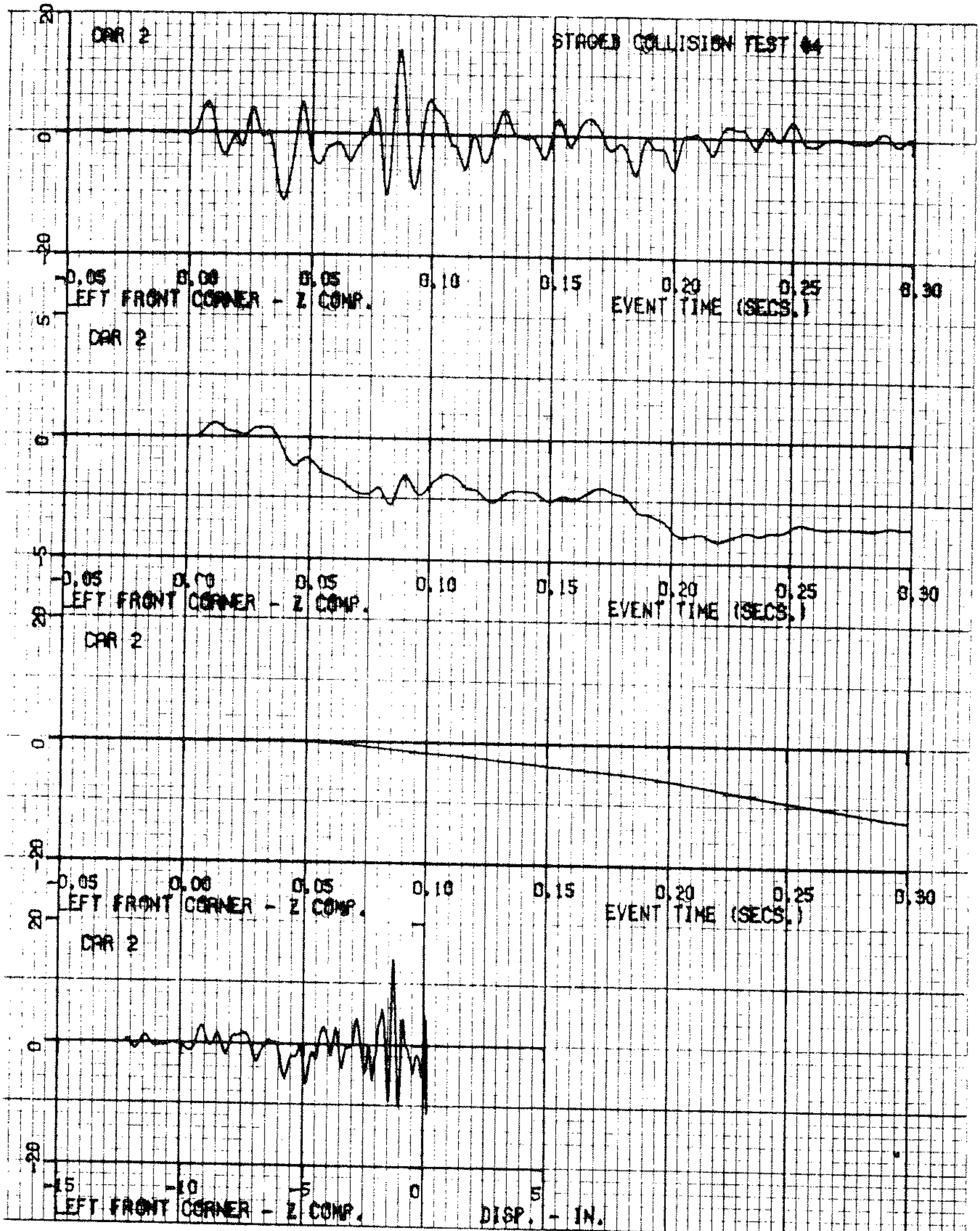
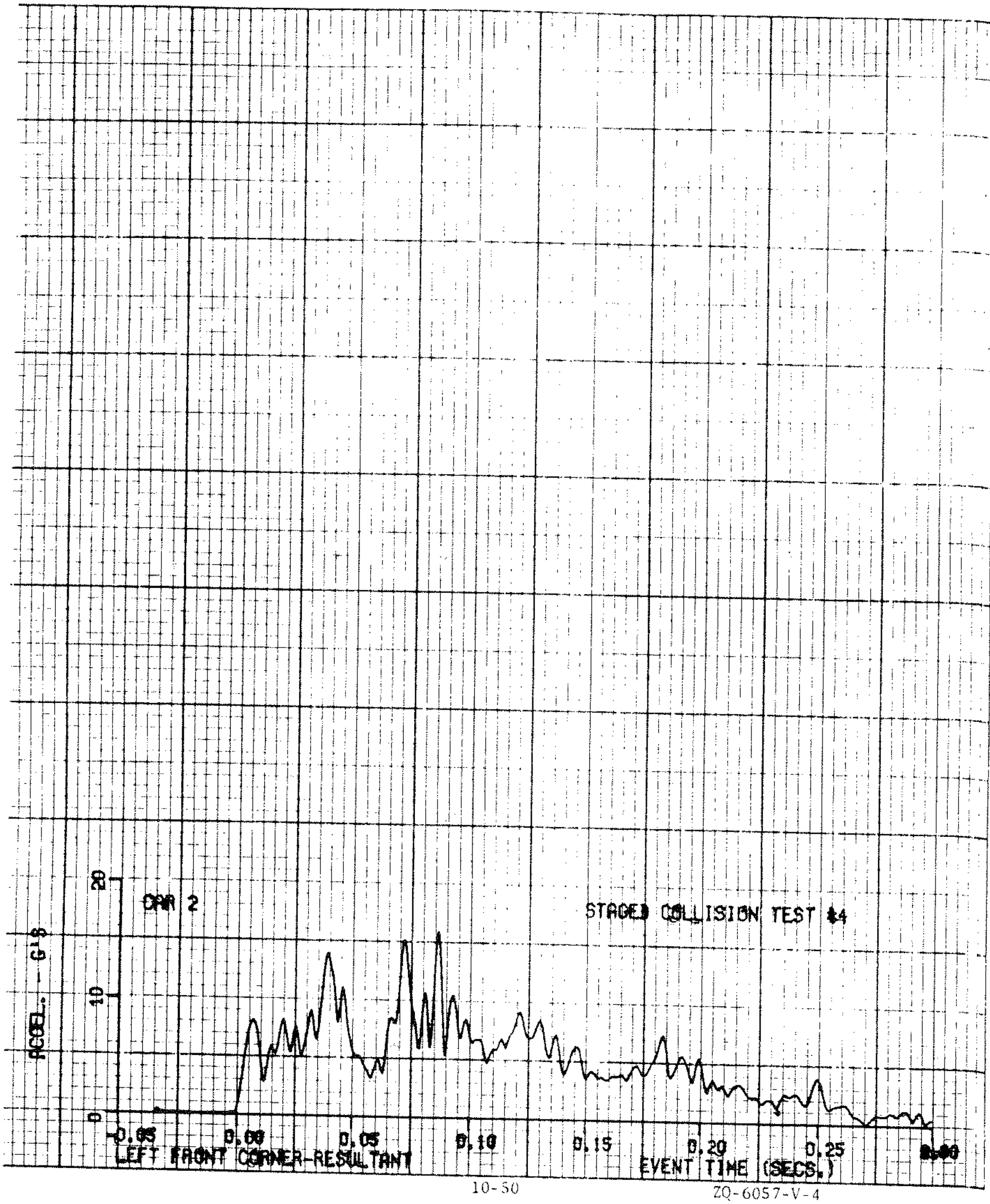
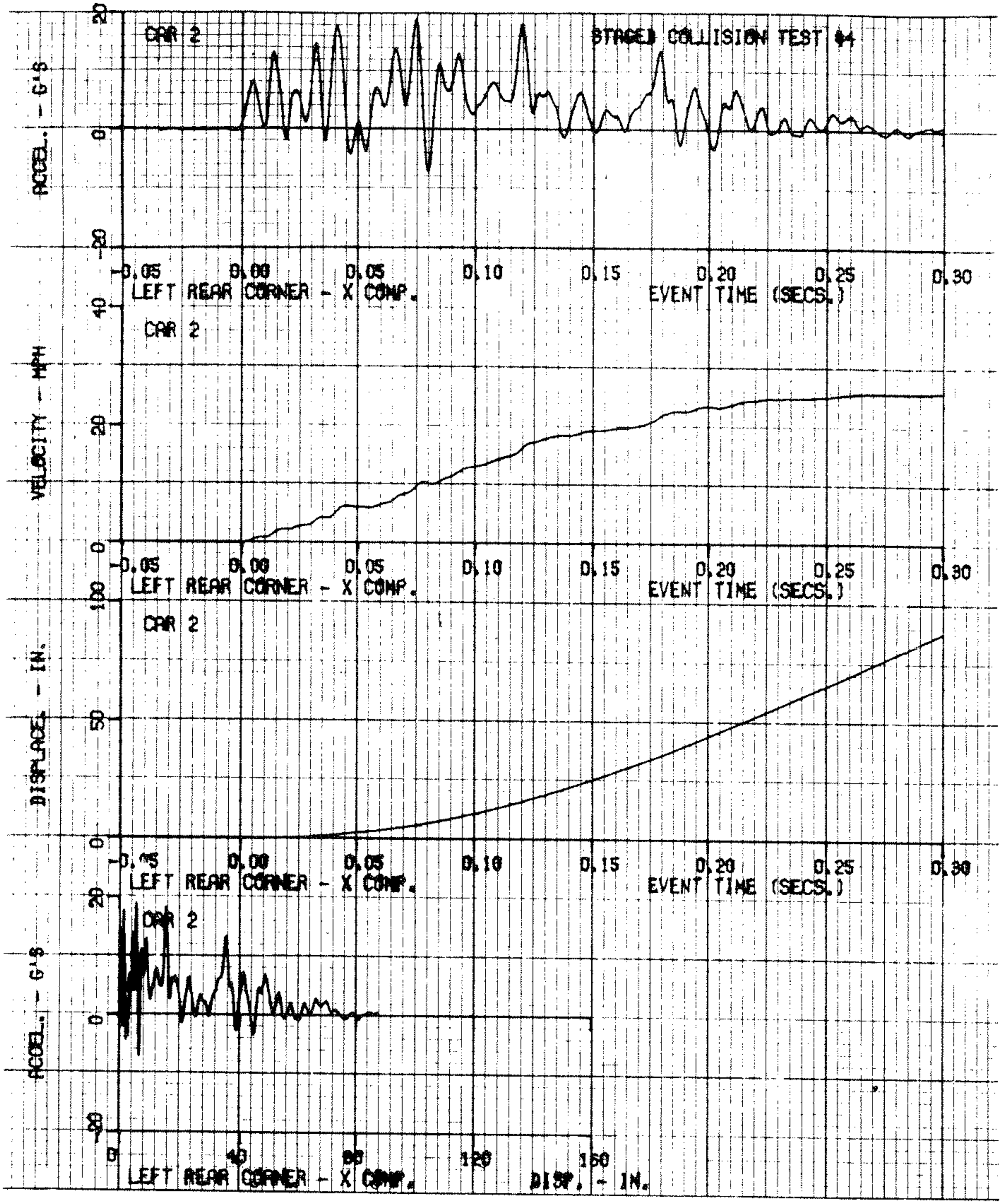
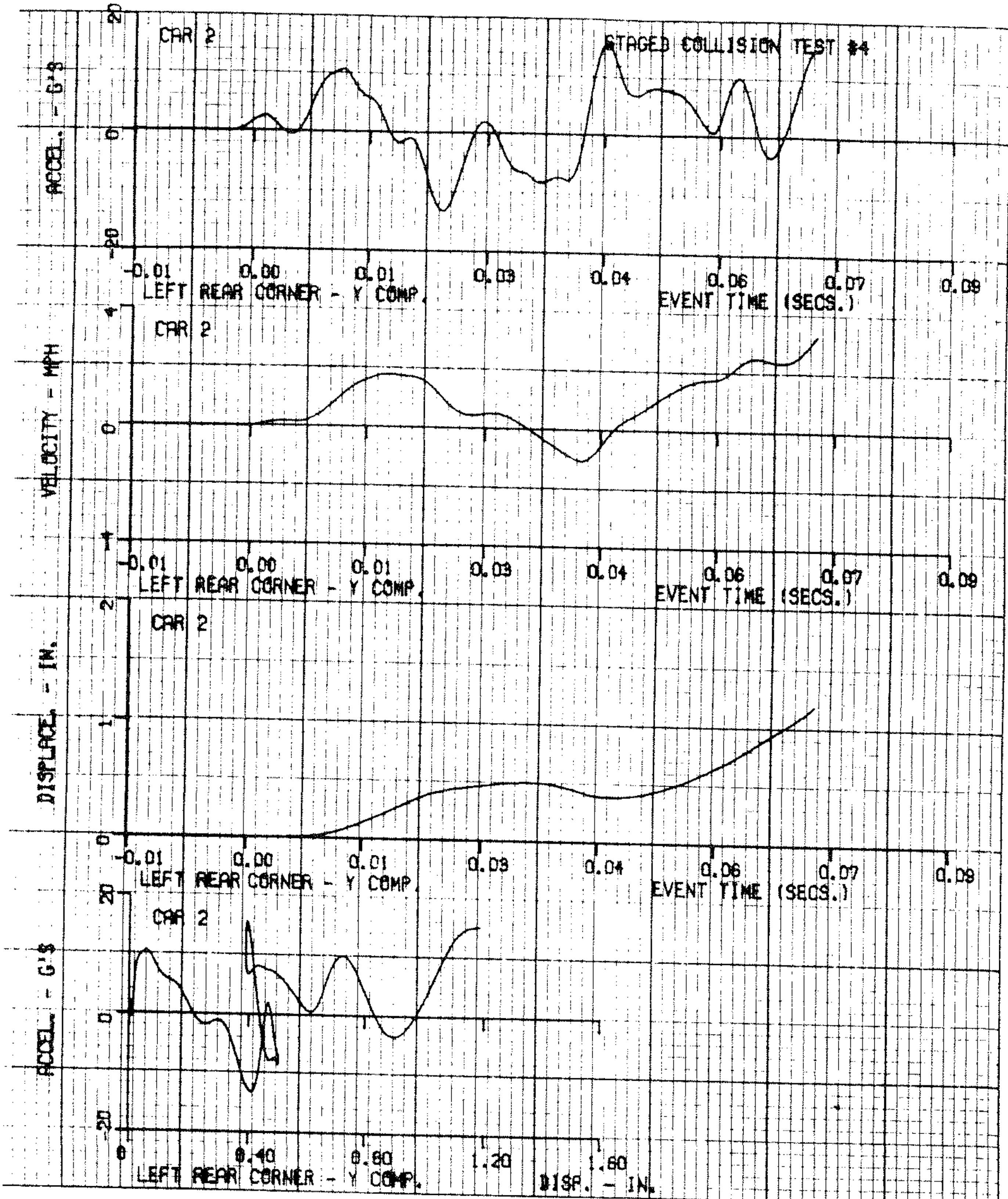

CAR 2
STAGED COLLISION TEST #4
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
5
0
-5
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
-15
-10
-5
0
5
LEFT FRONT CORNER - Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

ZQ-6057-V-4

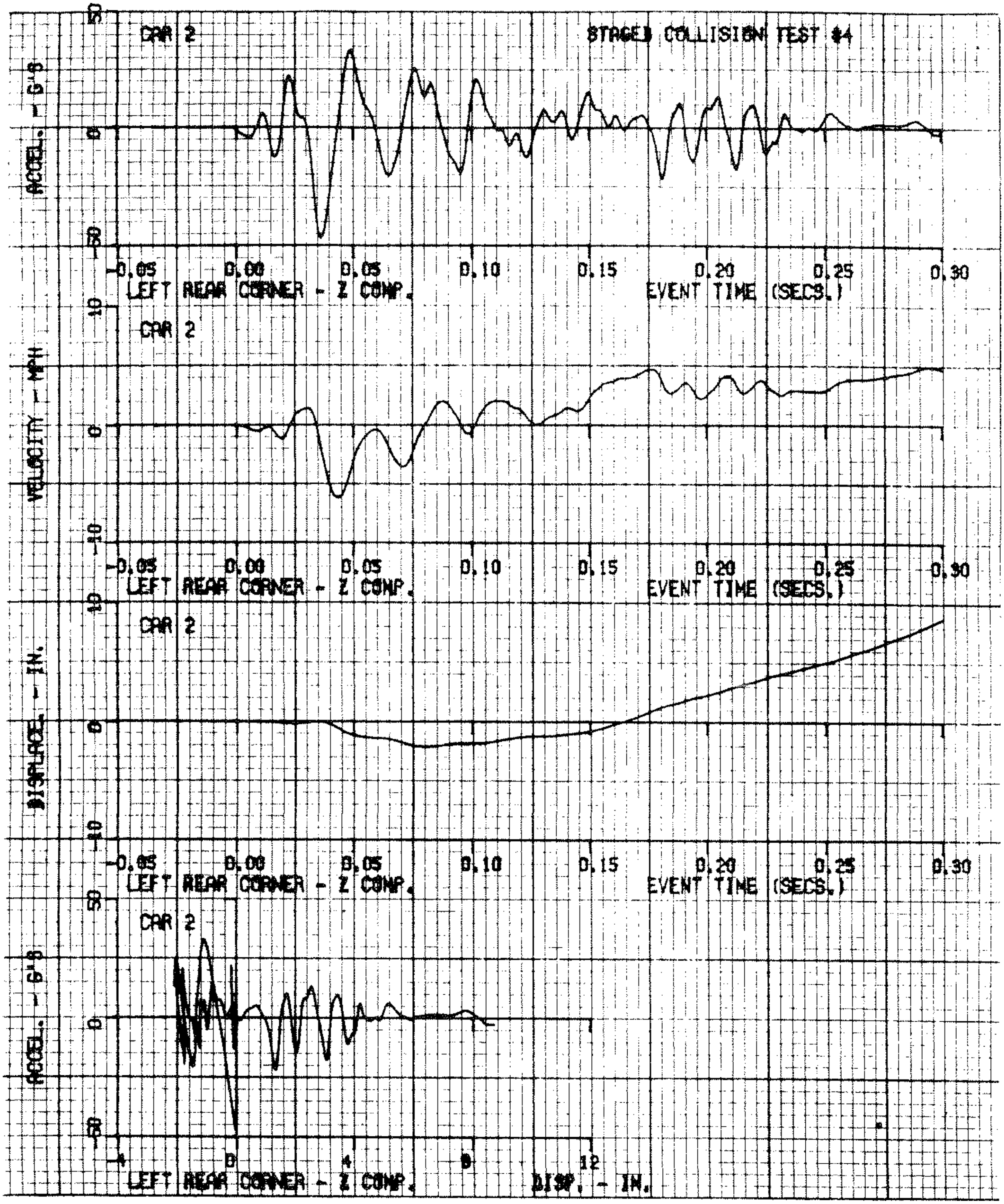


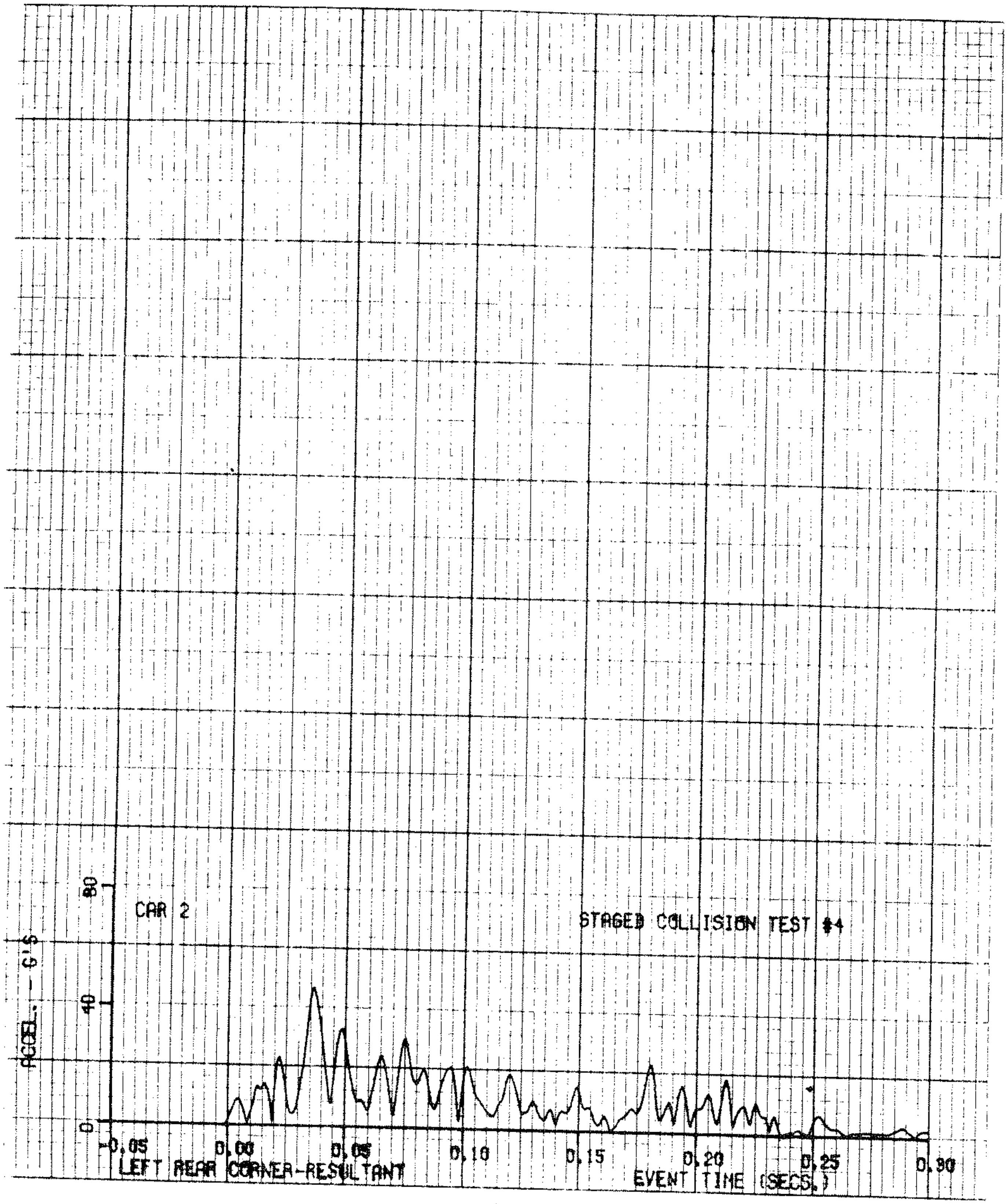
CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
20
0
DISPLACE. - IN.
100
50
0
DISP. - IN.
40
80
120
160

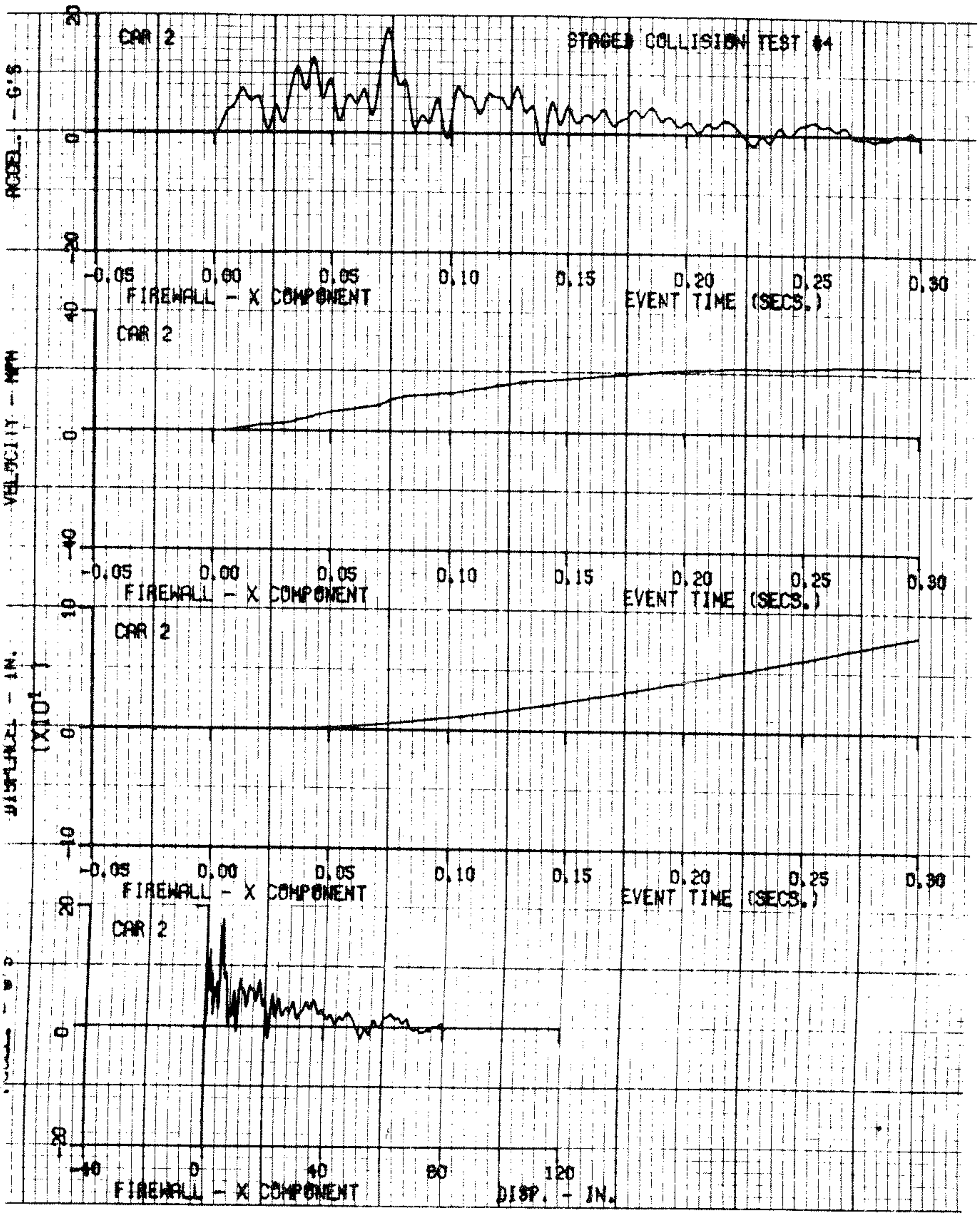


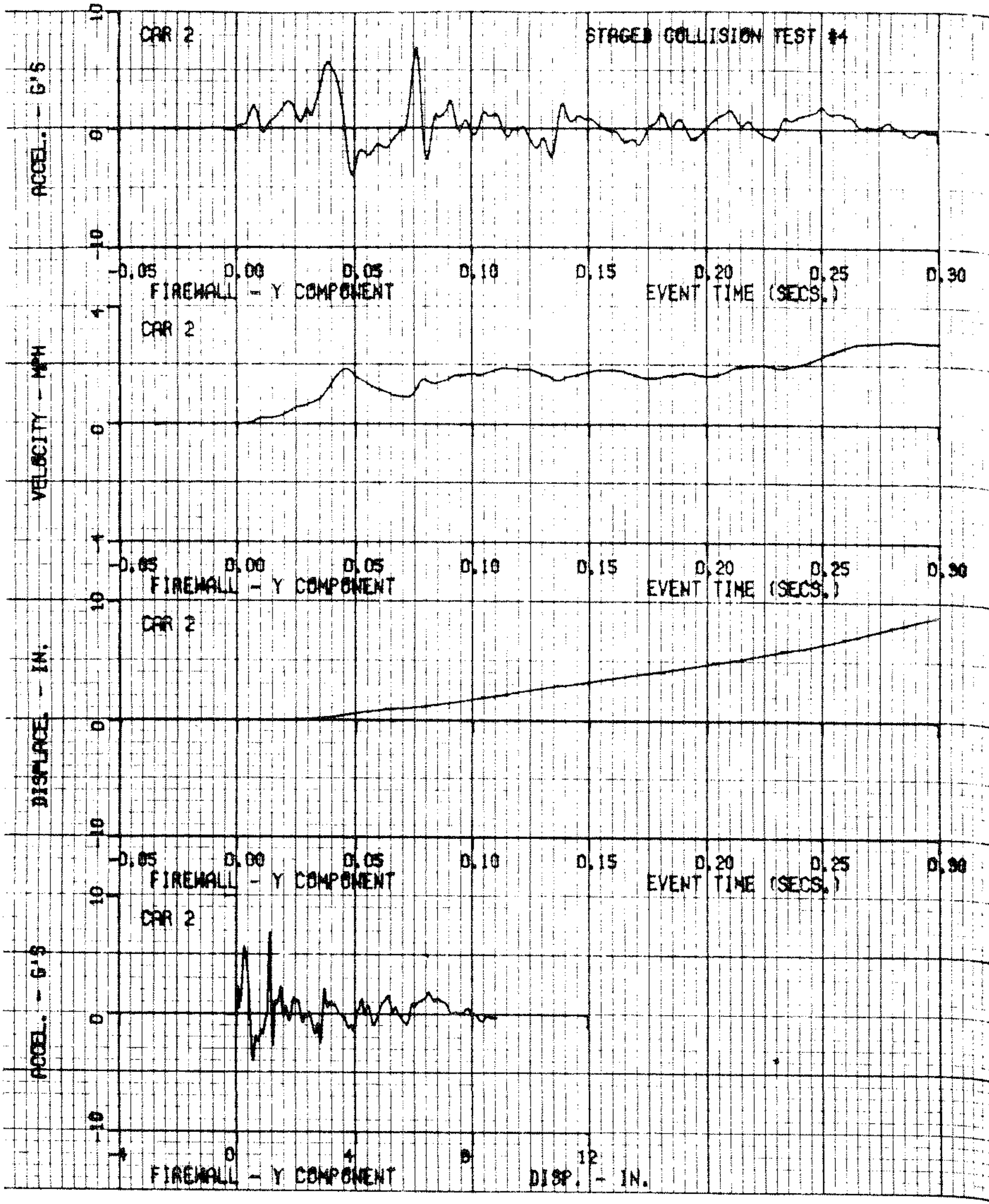
CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.01
0.00
0.01
0.03
0.04
0.06
0.07
0.09
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.01
0.00
0.01
0.03
0.04
0.06
0.07
0.09
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
2
1
0
-0.01
0.00
0.01
0.03
0.04
0.06
0.07
0.09
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
0
0.40
0.80
1.20
1.60
LEFT REAR CORNER - Y COMP.
DISP. - IN.

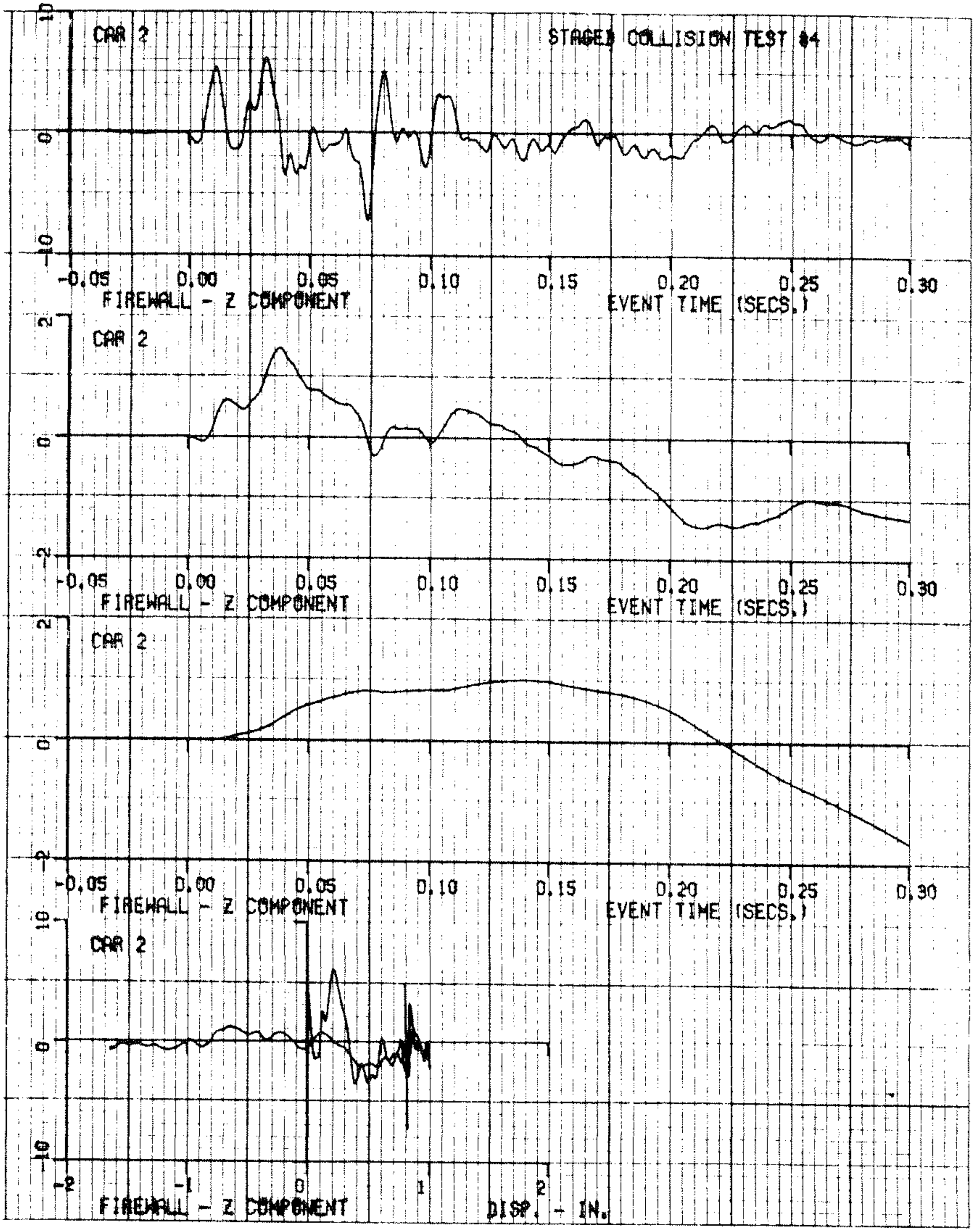
ZQ-6057-V-4

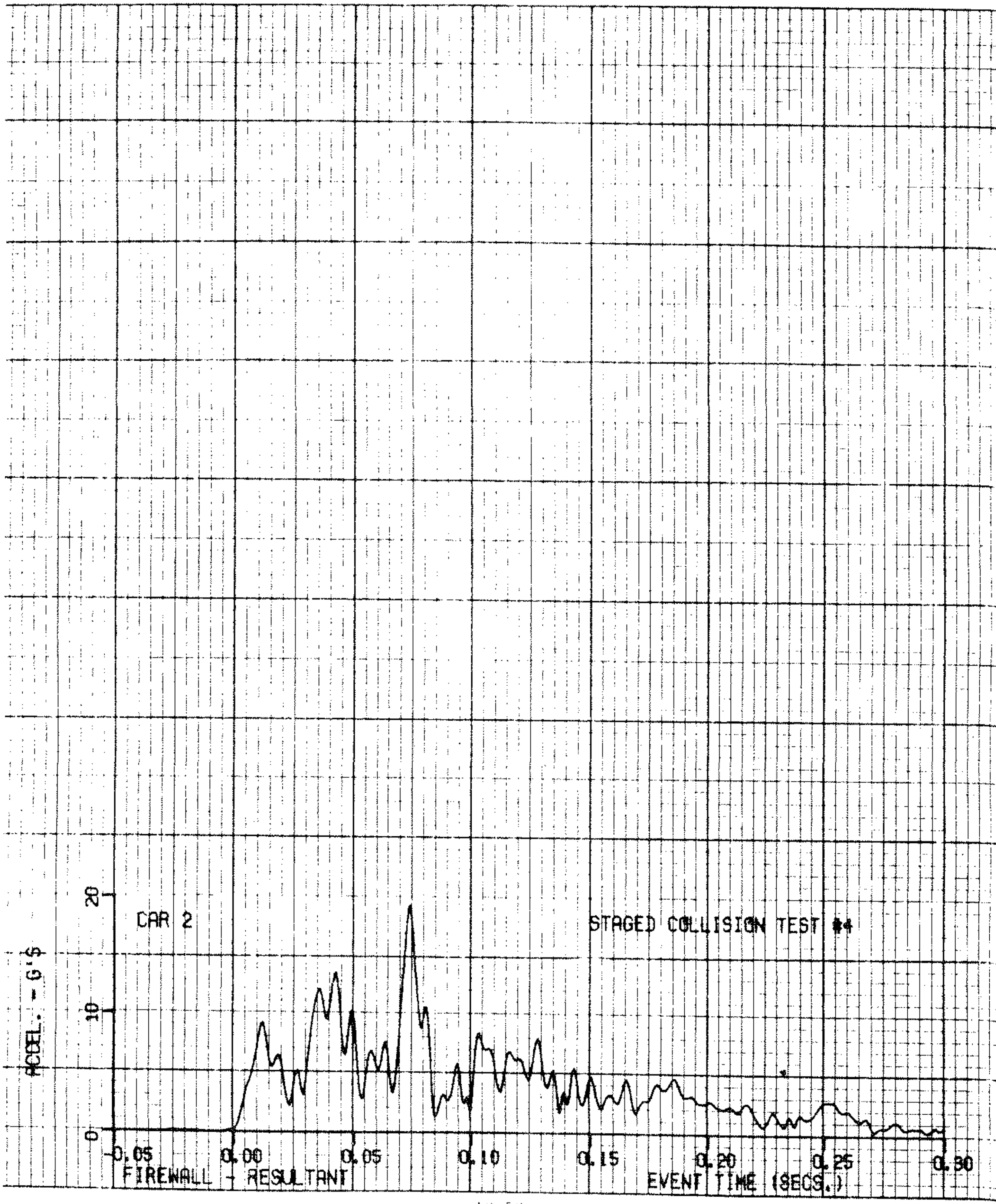

CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
50
0
-50
-4
0
4
8
12
LEFT REAR CORNER - Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER-RESULTANT
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACEMENT - IN.
(X10¹)
10
0
-10
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
20
0
-20
-40
0
40
80
120
FIREWALL - X COMPONENT
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
-10
-4
0
4
8
12
FIREWALL - Y COMPONENT
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 2
10
0
-10
-2
-1
0
1
2
FIREWALL - Z COMPONENT
DISP. - IN.



10 58

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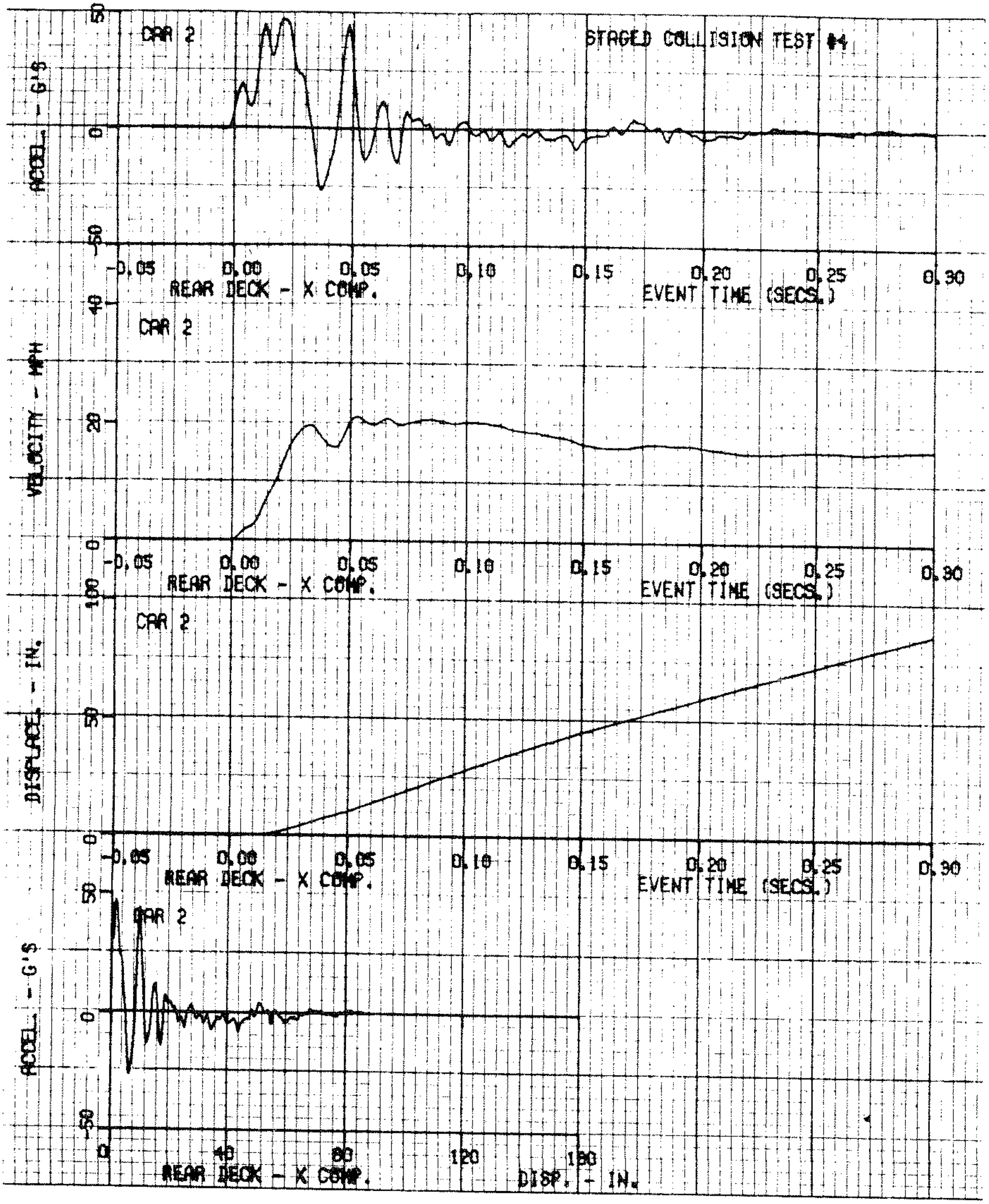
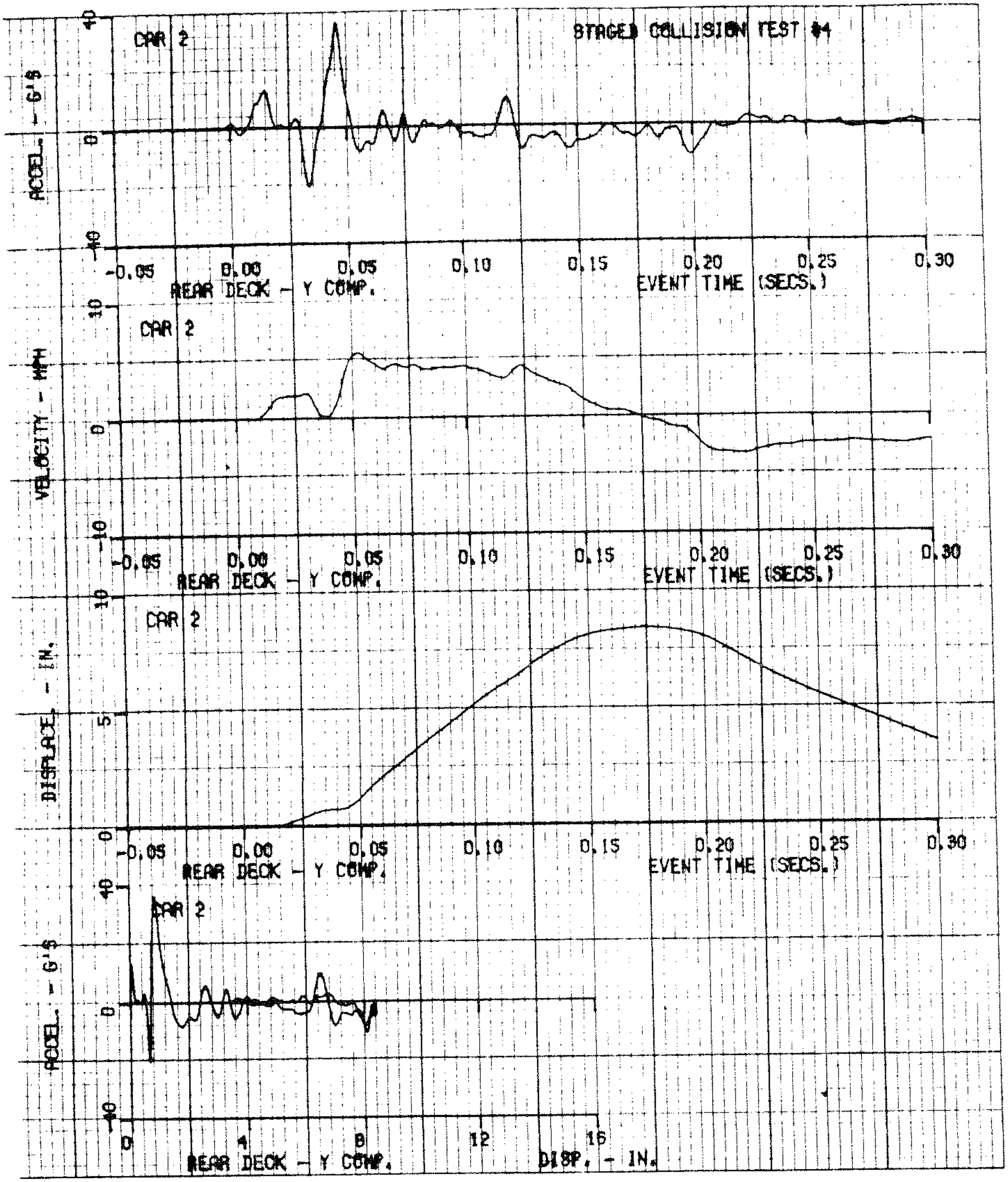
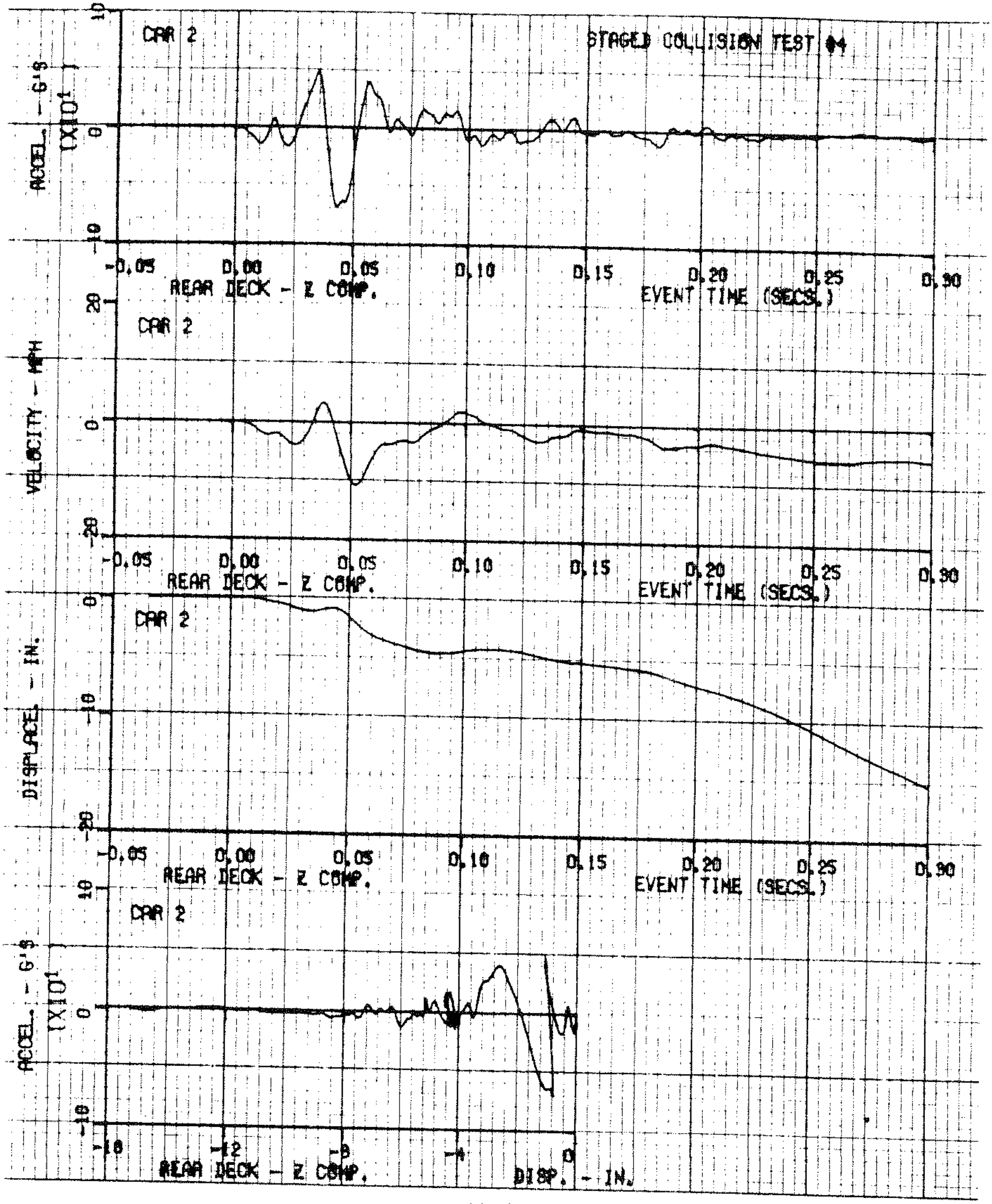
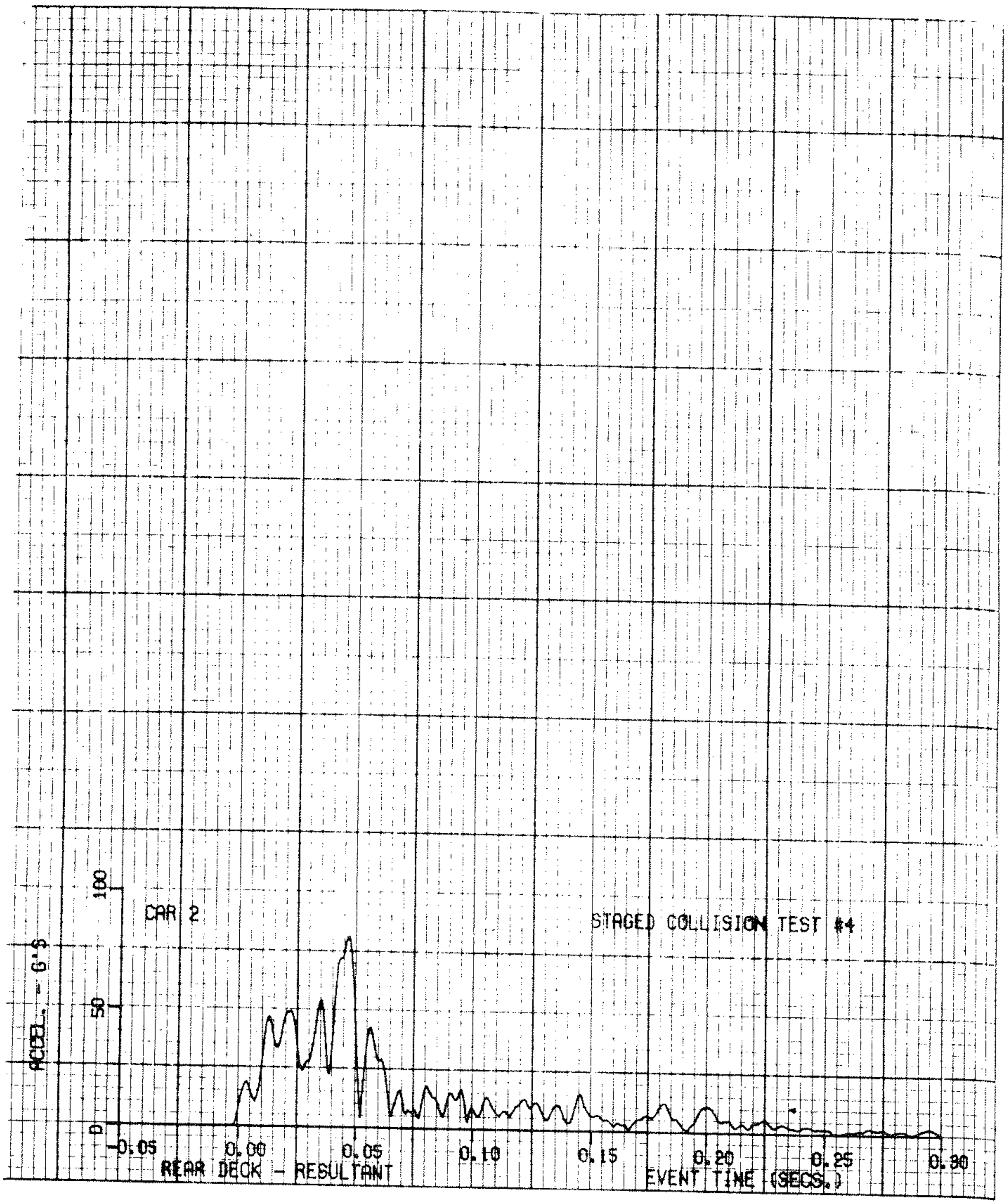

CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
100
50
0
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
0
40
80
120
160
REAR DECK - X COMP.
DISP. - IN.


STAGED COLLISION TEST #4
CAR 2
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
5
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
4
8
12
16
REAR DECK - Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
DISPLACE. - IN.
0
-10
-20
CAR 2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
10
0
-10
-16
-12
-8
-4
0
REAR DECK - Z COMP.
DISP. - IN.

ZQ-6057-V-4


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
100
50
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)

ZQ-6057-V-4

Table

DUMMY INJURY CRITERIA VALUES

CAR 2 - STRUCK VEHICLE

	MAXIMUM ACCELERATION ("G") *											
	HEAD				CHEST				PELVIS			
	X	Y	Z	R	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	45	20	31	50	55	5	9	56	22			
DUMMY (2)	22	7	16	24	11	6.5	6.5	14	12			
DUMMY (3)												
DUMMY (4)												

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-150	-350
DUMMY (2)	118	80
DUMMY (3)		
DUMMY (4)		

	MAXIMUM FORCE-SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)			
DUMMY (2)			
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX	
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2	HEAD	CHEST
DUMMY (1)	204.7	.095	.114	40.6	266	200
DUMMY (2)	119.2	.118	.198	18.6	144	43
DUMMY (3)						
DUMMY (4)						

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

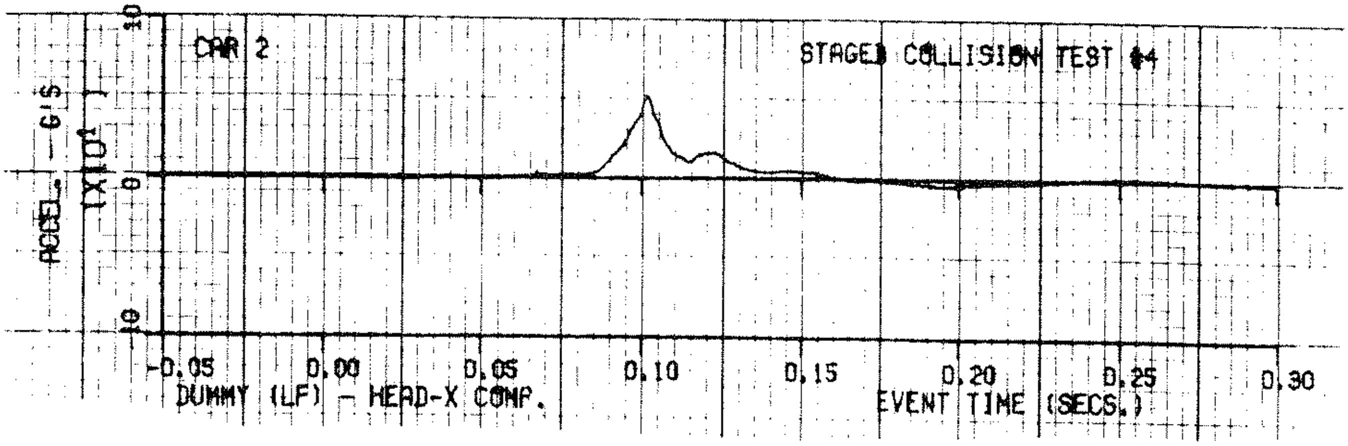
**AS DEFINED IN FMVSS NO. 208

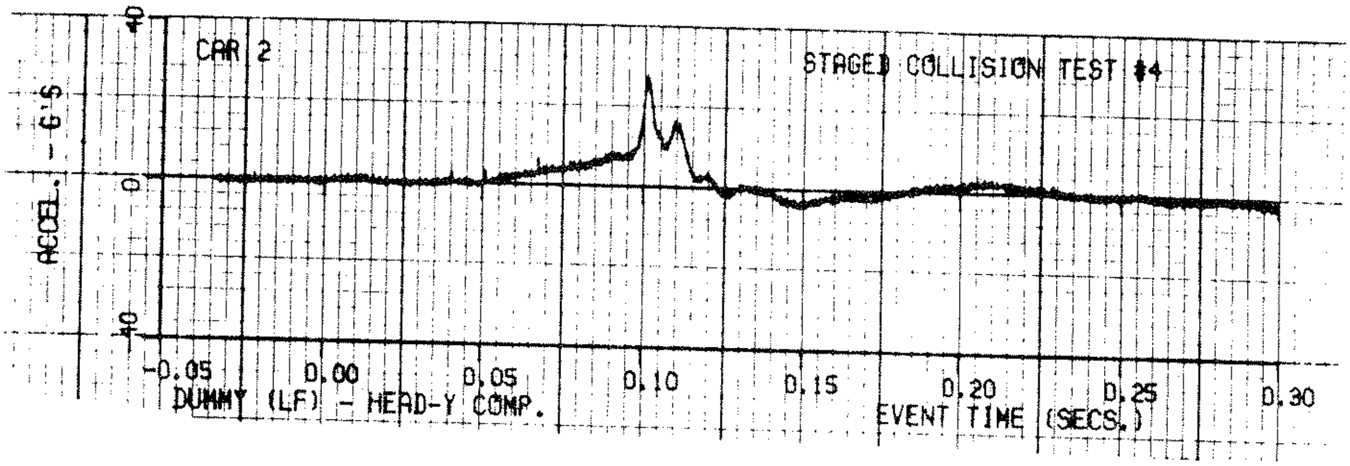
RiCSAC TEST NO. 4

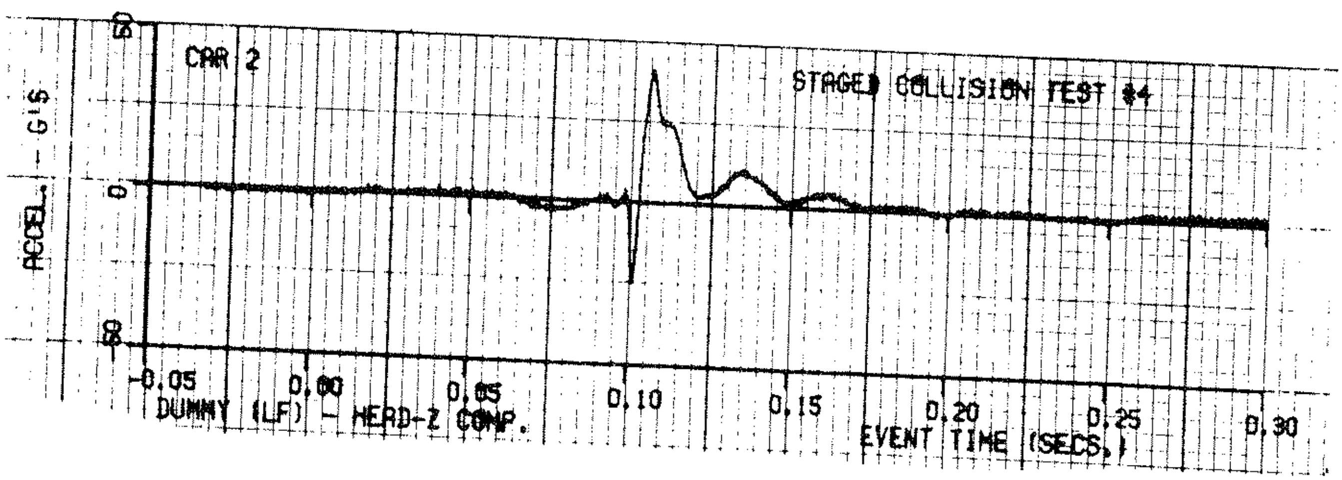
DUMMY DATA

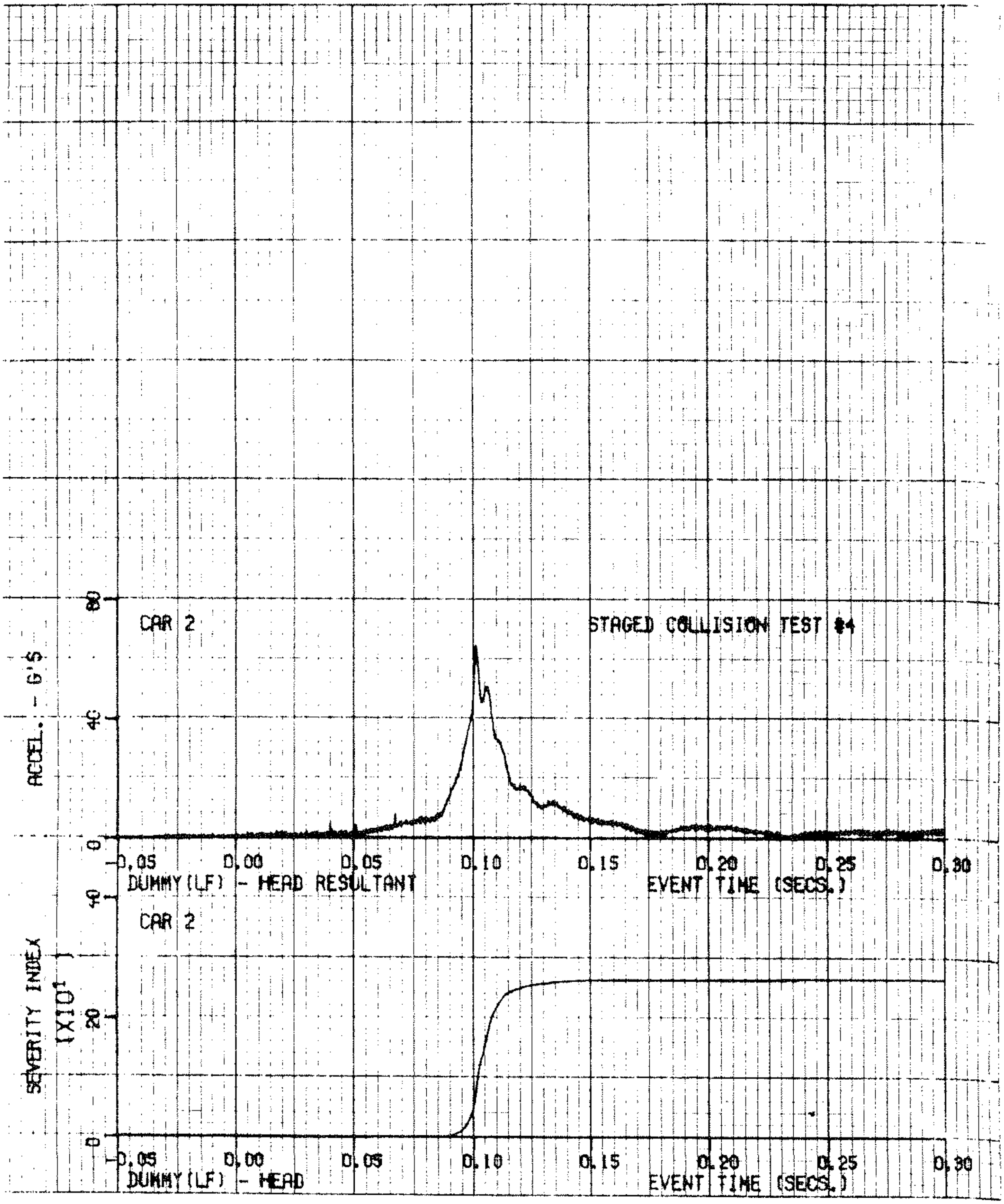
CAR NO. 2 PINTO

DATA PLOTS		FILTER CLASS
HEAD ACCELERATION	X,Y,X	1000
HEAD RESULTANT		
HEAD SEVERITY INDEX		
CHEST ACCELERATION	X,Y,Z	180
CHEST RESULTANT		
CHEST VELOCITY	X,Y,Z	
CHEST DISPLACEMENT	X,Y,Z	
CHEST SEVERITY INDEX		
PELVIC ACCELERATION	X	180
PELVIC VELOCITY	X	
PELVIC DISPLACEMENT	X	
FEMUR LOADS	L & R	600

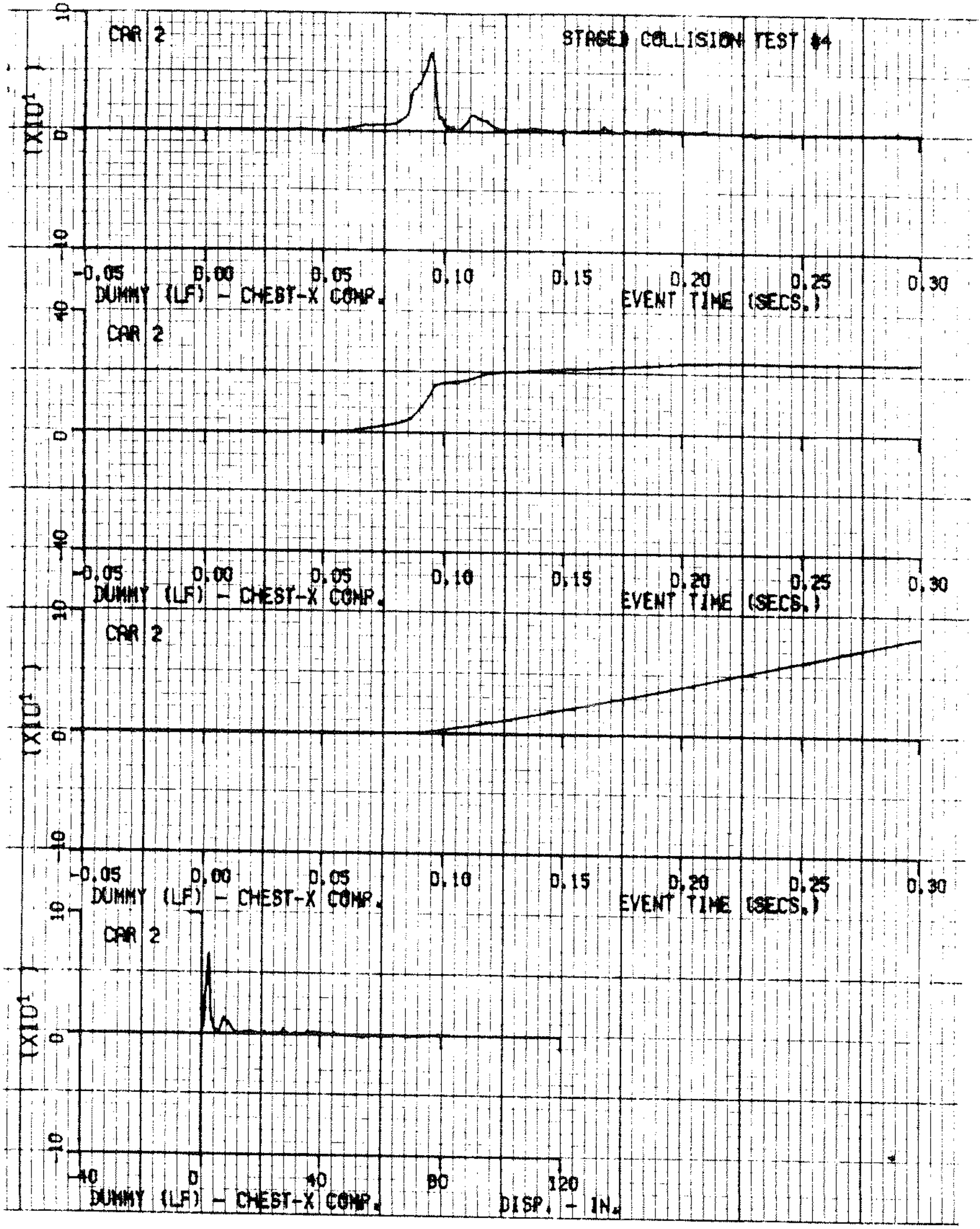

CAR 2
STAGED COLLISION TEST #4
ACCEL. — G'S (X10¹)
10
0
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) — HEAD-X COMP.
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. — G'S
40
0
40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) — HEAD-Y COMP.
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. — G'S
50
0
50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) — HEAD-Z COMP.
EVENT TIME (SECS.)



80
40
0
ACCEL. - G'S
CAR 2
STAGED COLLISION TEST #4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD RESULTANT
EVENT TIME (SECS.)
40
20
0
SEVERITY INDEX
(X10¹)
CAR 2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
[X10^1]
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
40
0
-40
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
-40
0
40
80
120
DUMMY (LF) - CHEST-X COMP.
DISP. - IN.

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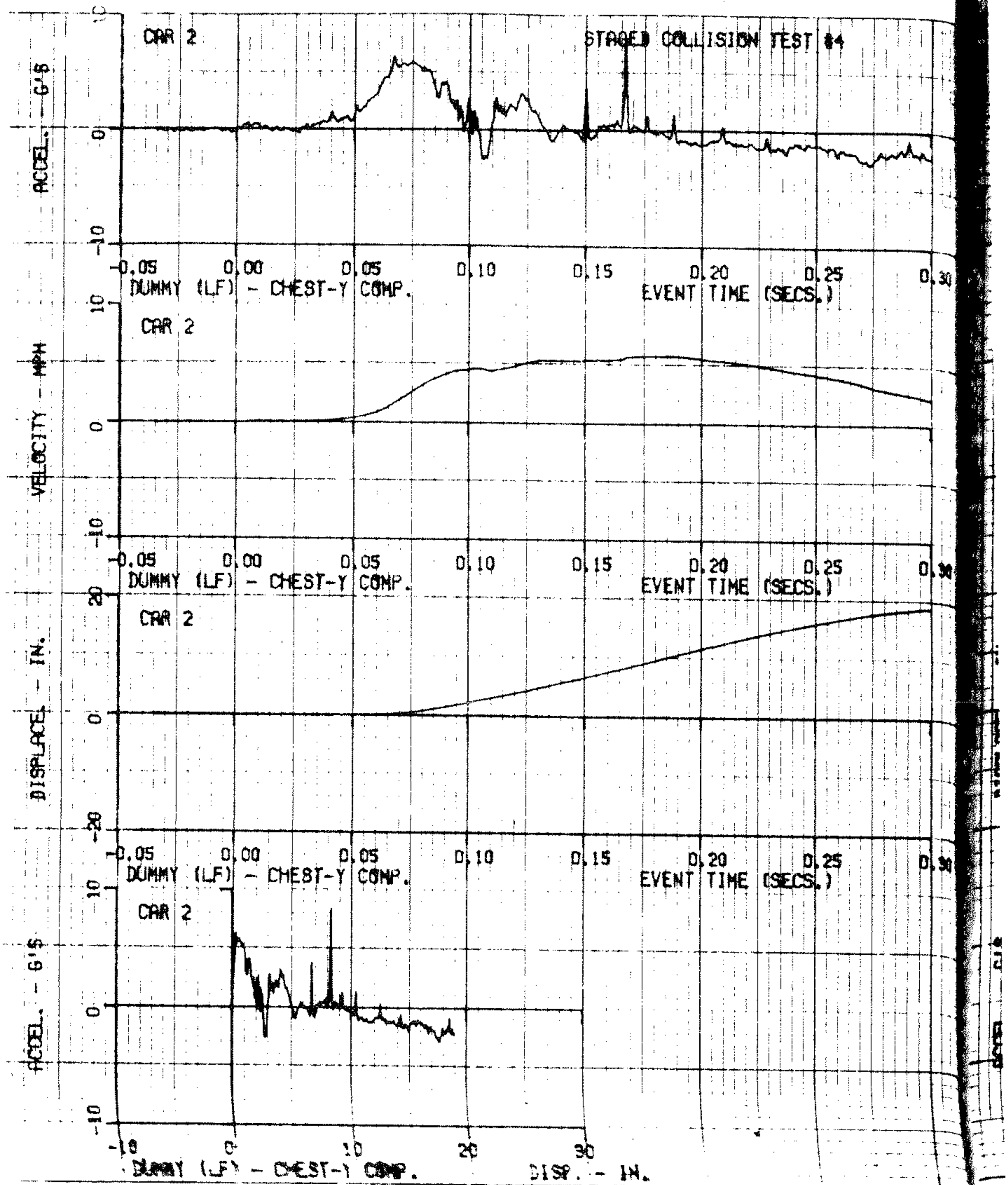
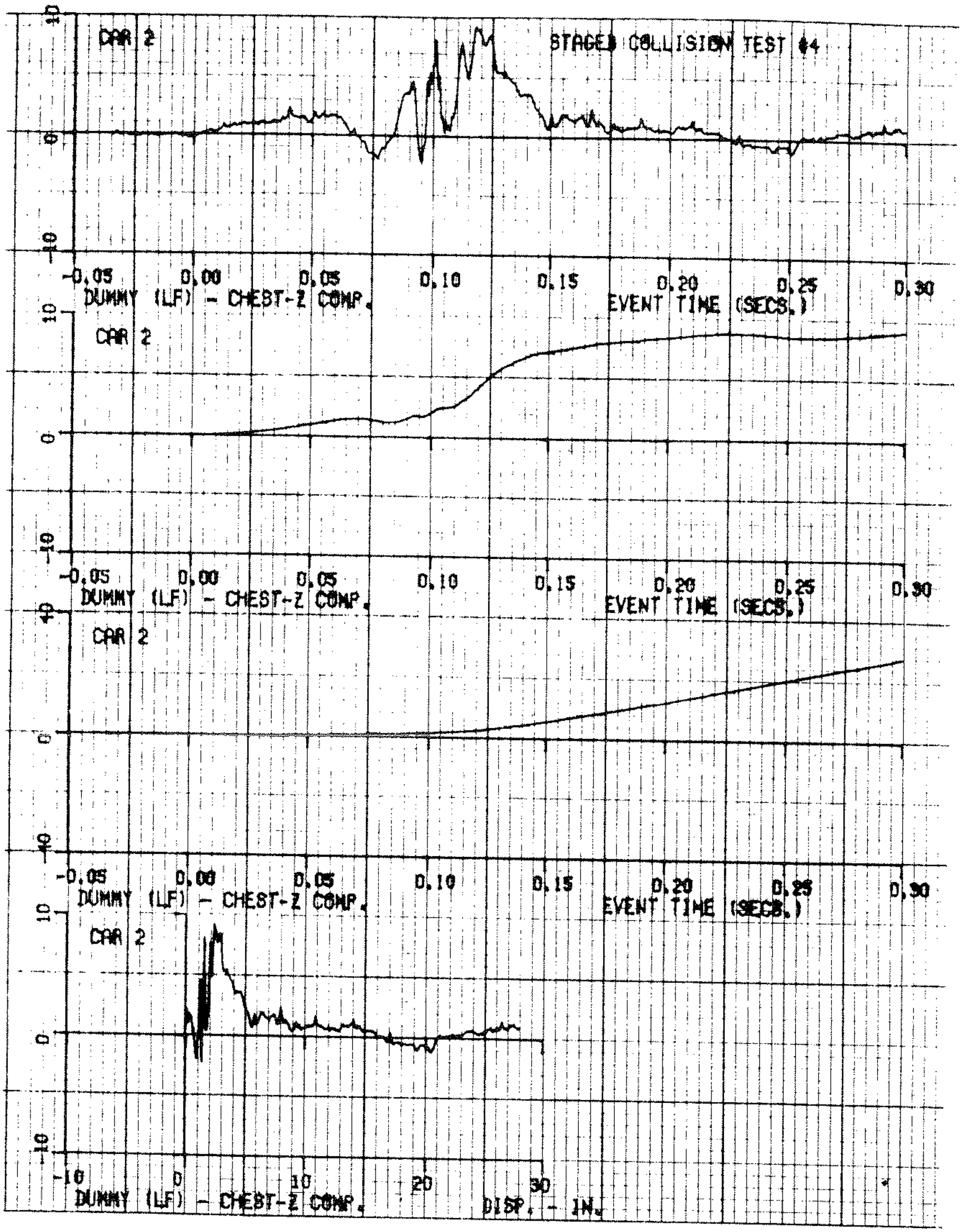
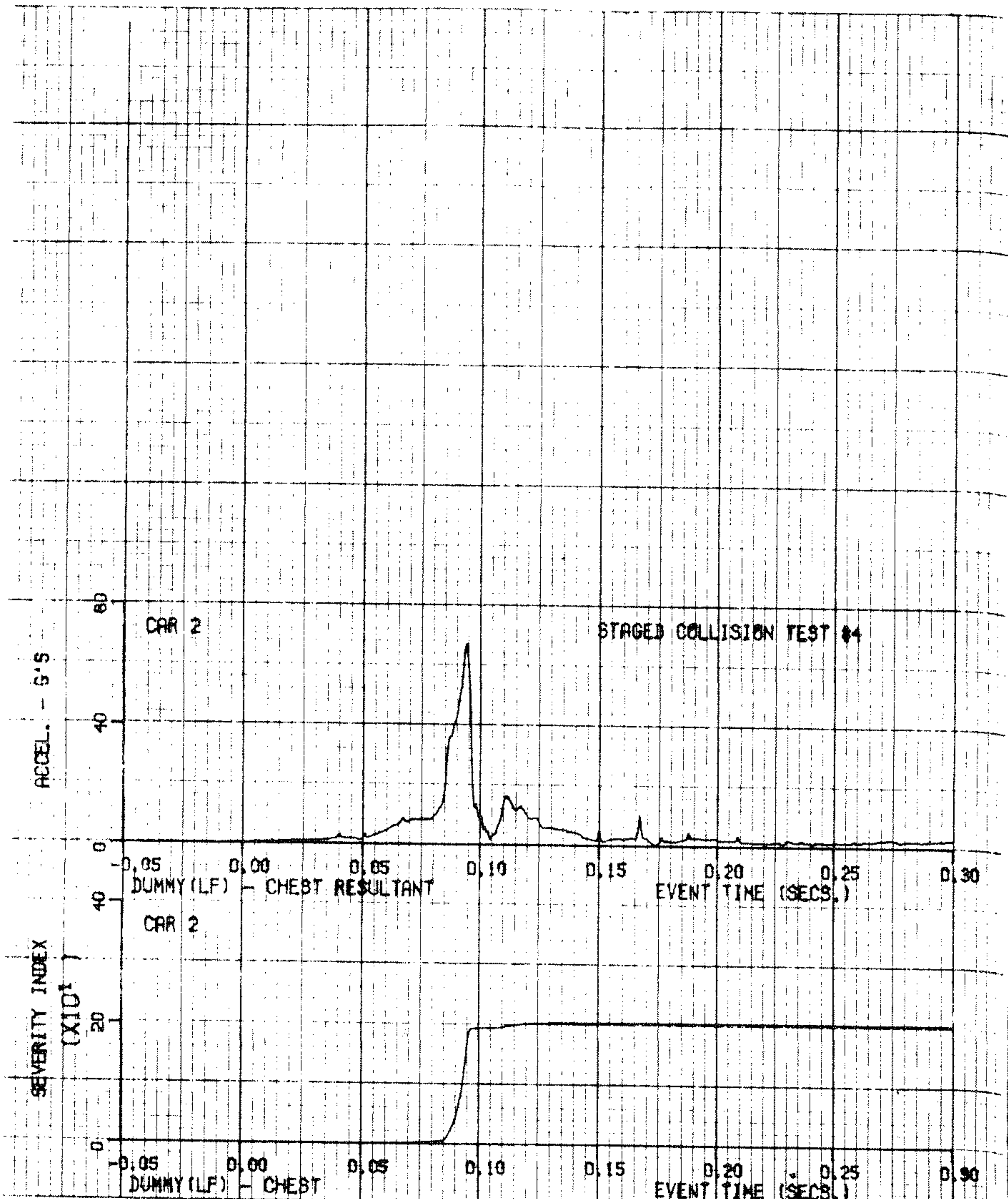
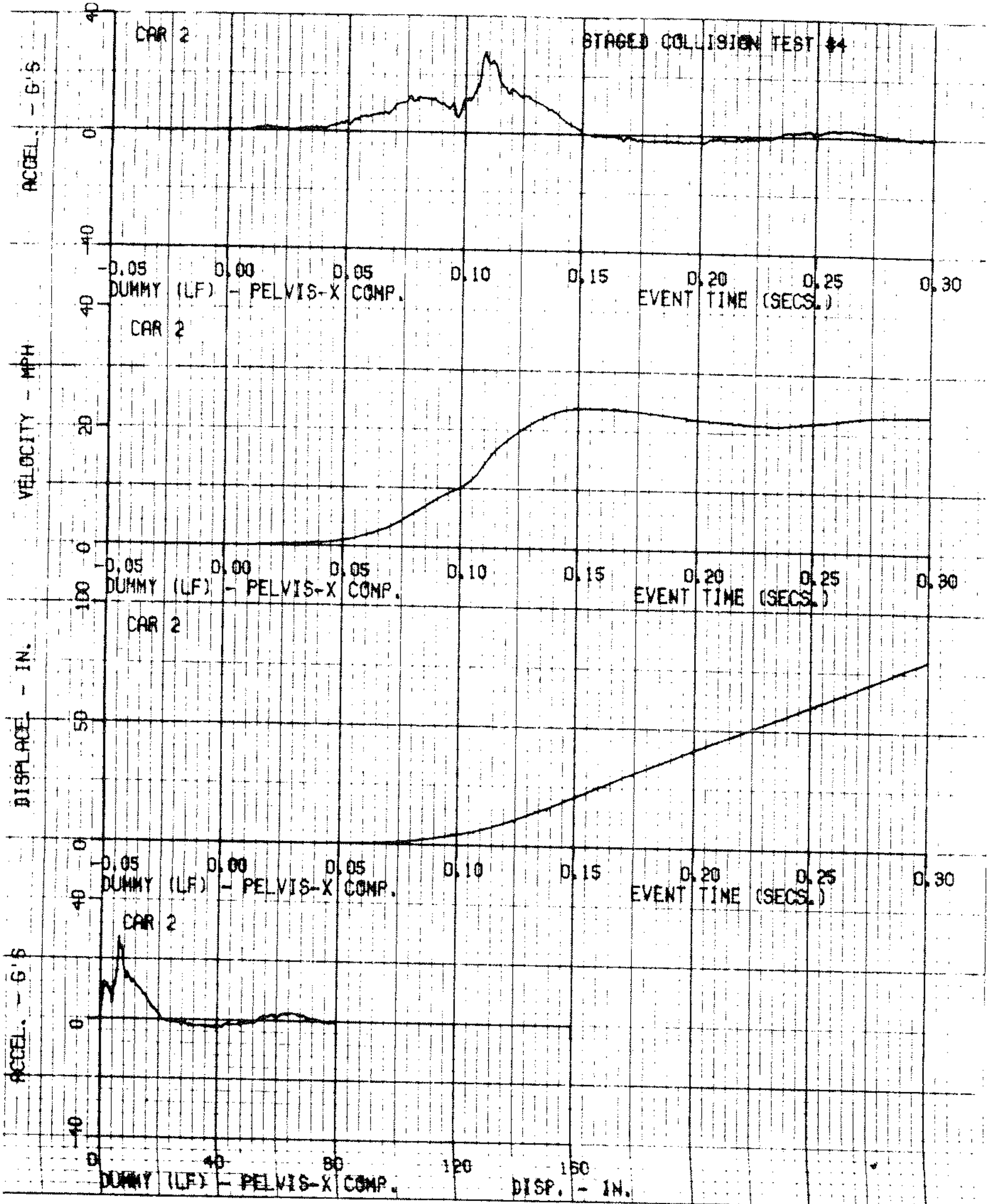
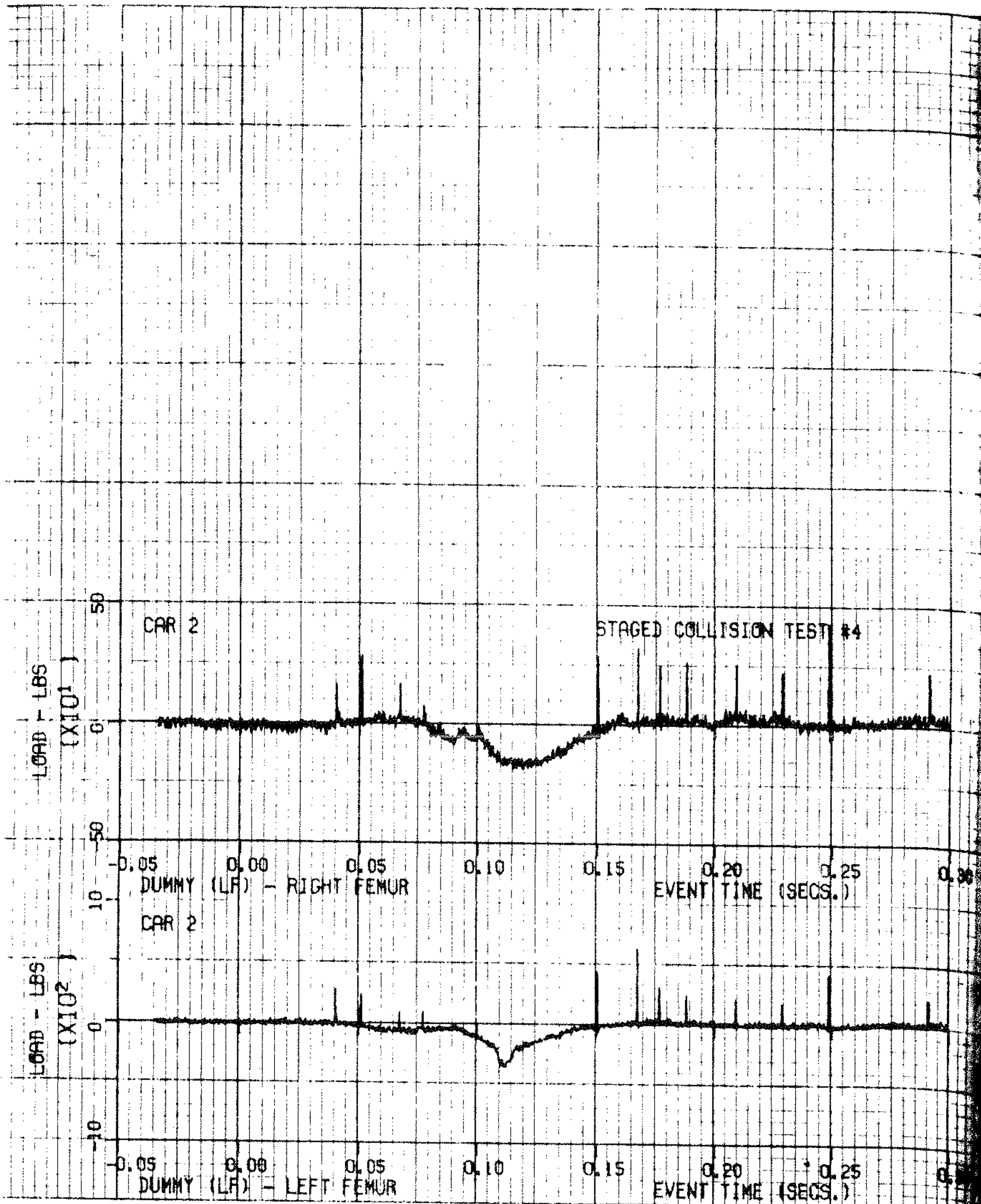

CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
10
0
-10
-10
0
10
20
30
DUMMY (LF) - CHEST-Z COMP.
DISP. - IN.



10-70 ZQ-6057-V-4


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
100
50
0
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
40
80
120
160
DUMMY (LF) - PELVIS-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
LOAD - LBS
(X10^1)
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - RIGHT FEMUR
EVENT TIME (SECS.)
CAR 2
LOAD - LBS
(X10^2)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
DUMMY (LF) - LEFT FEMUR
EVENT TIME (SECS.)

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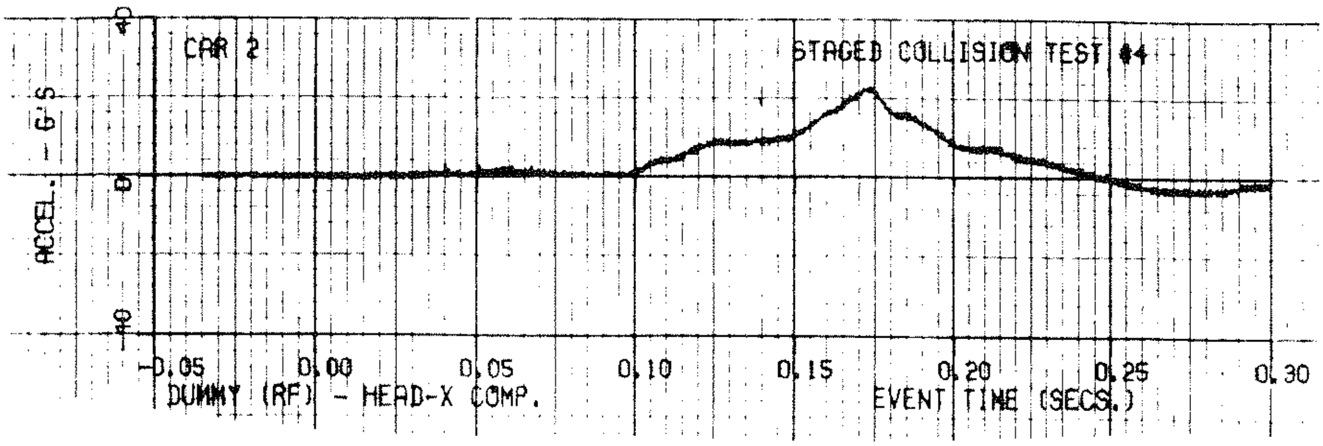
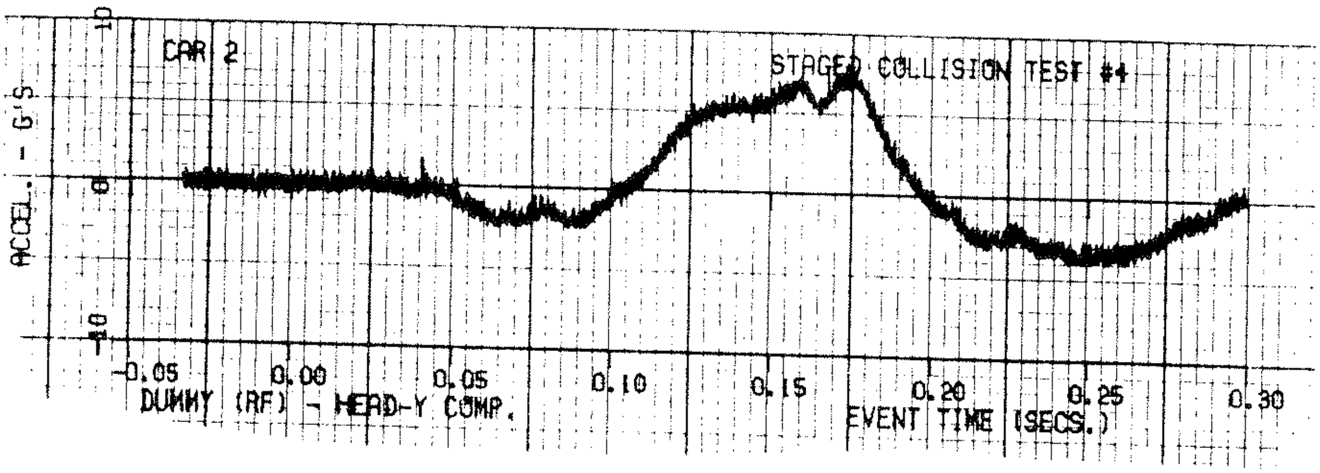
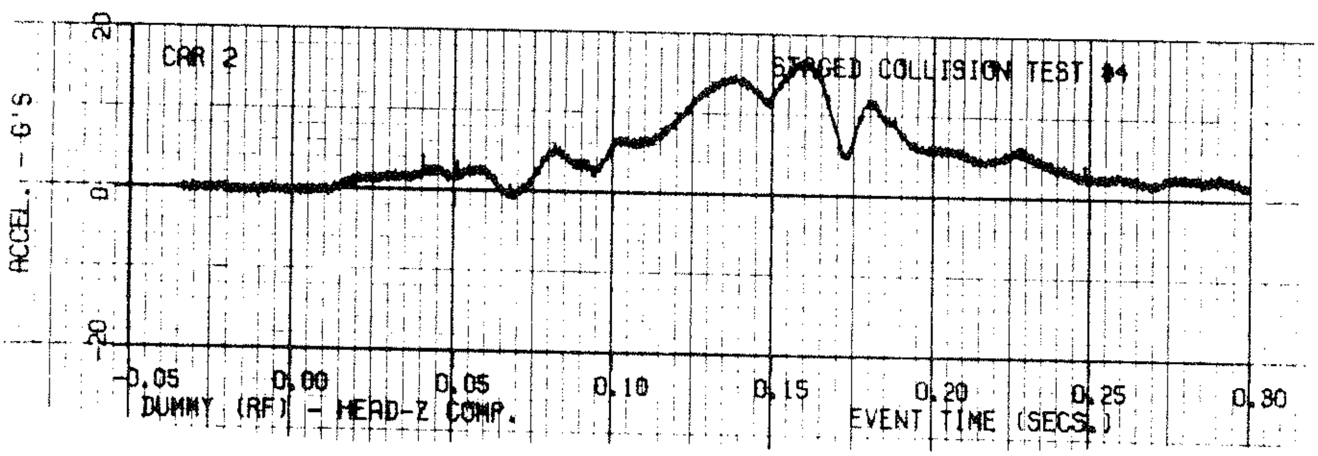
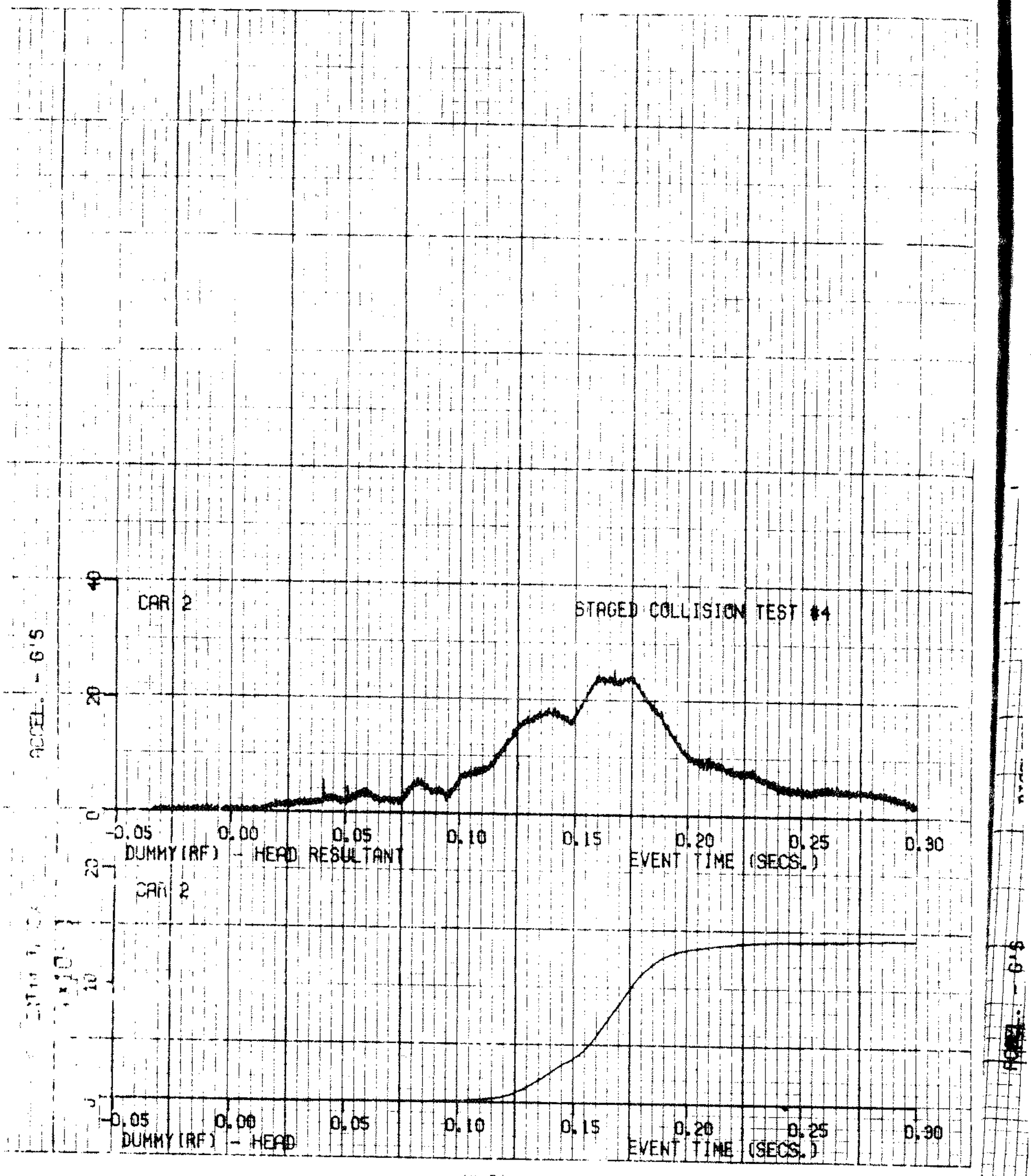

CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Y COMP.
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - HEAD RESULTANT
EVENT TIME (SECS.)
CAR 2
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - HEAD
EVENT TIME (SECS.)

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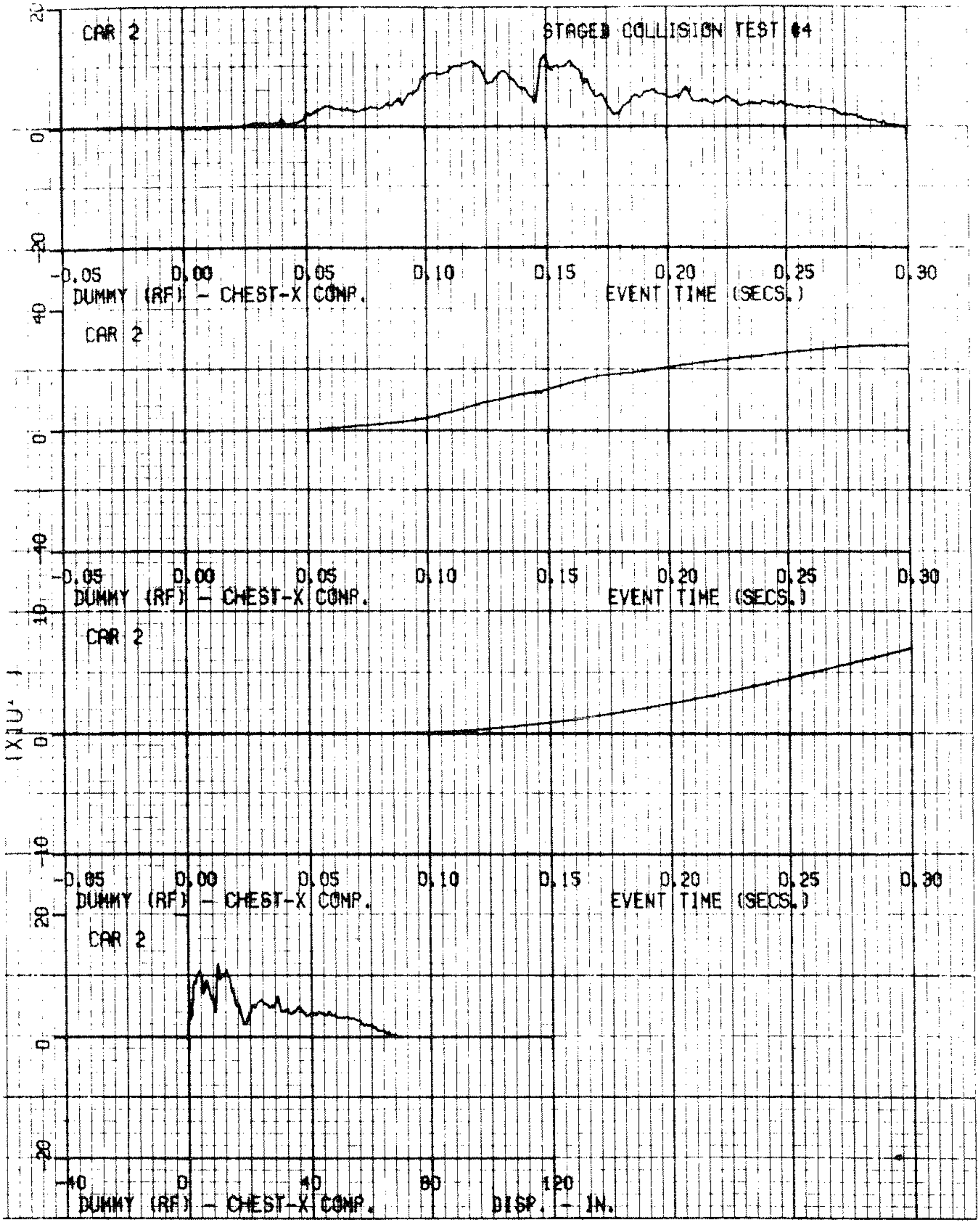
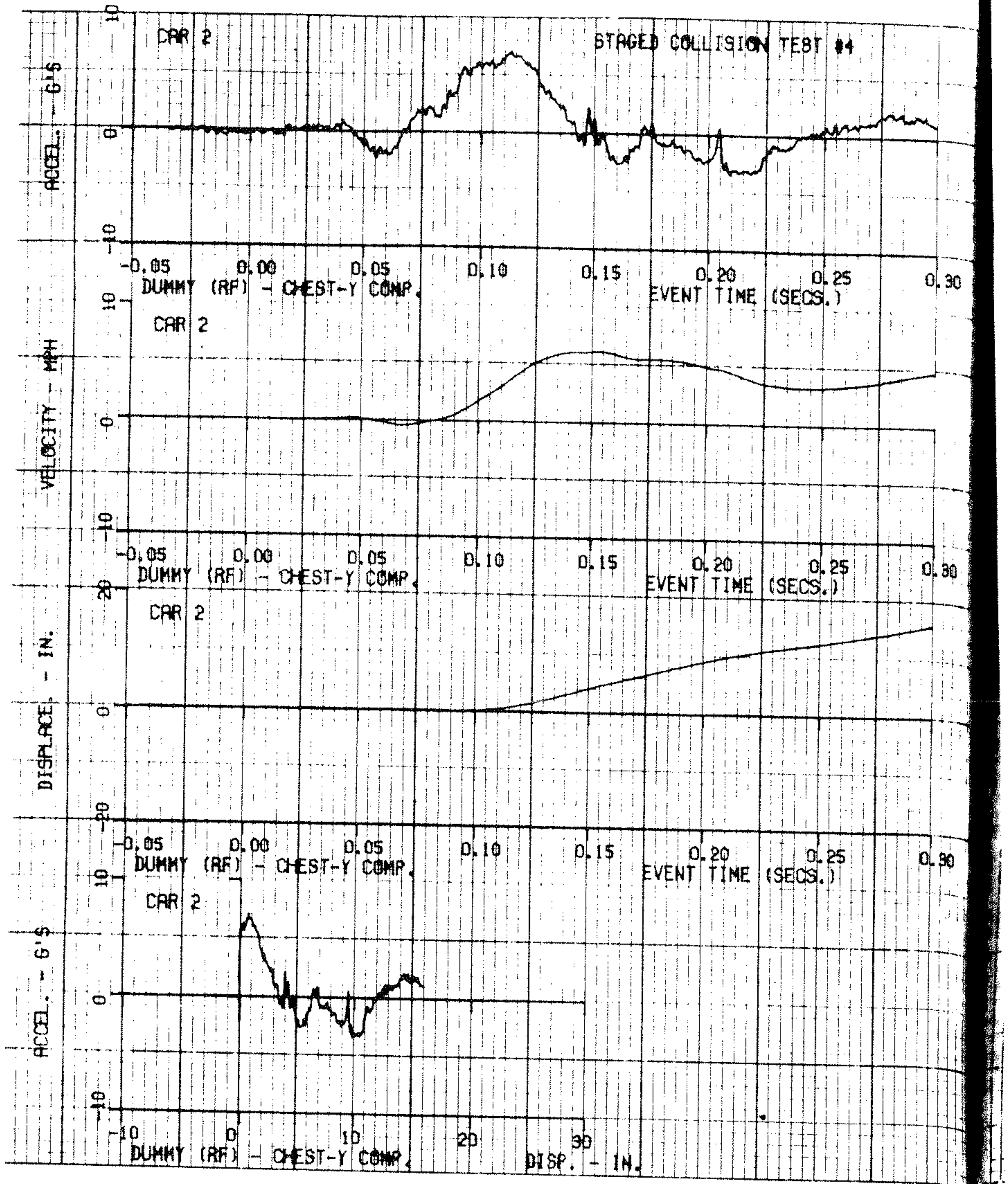
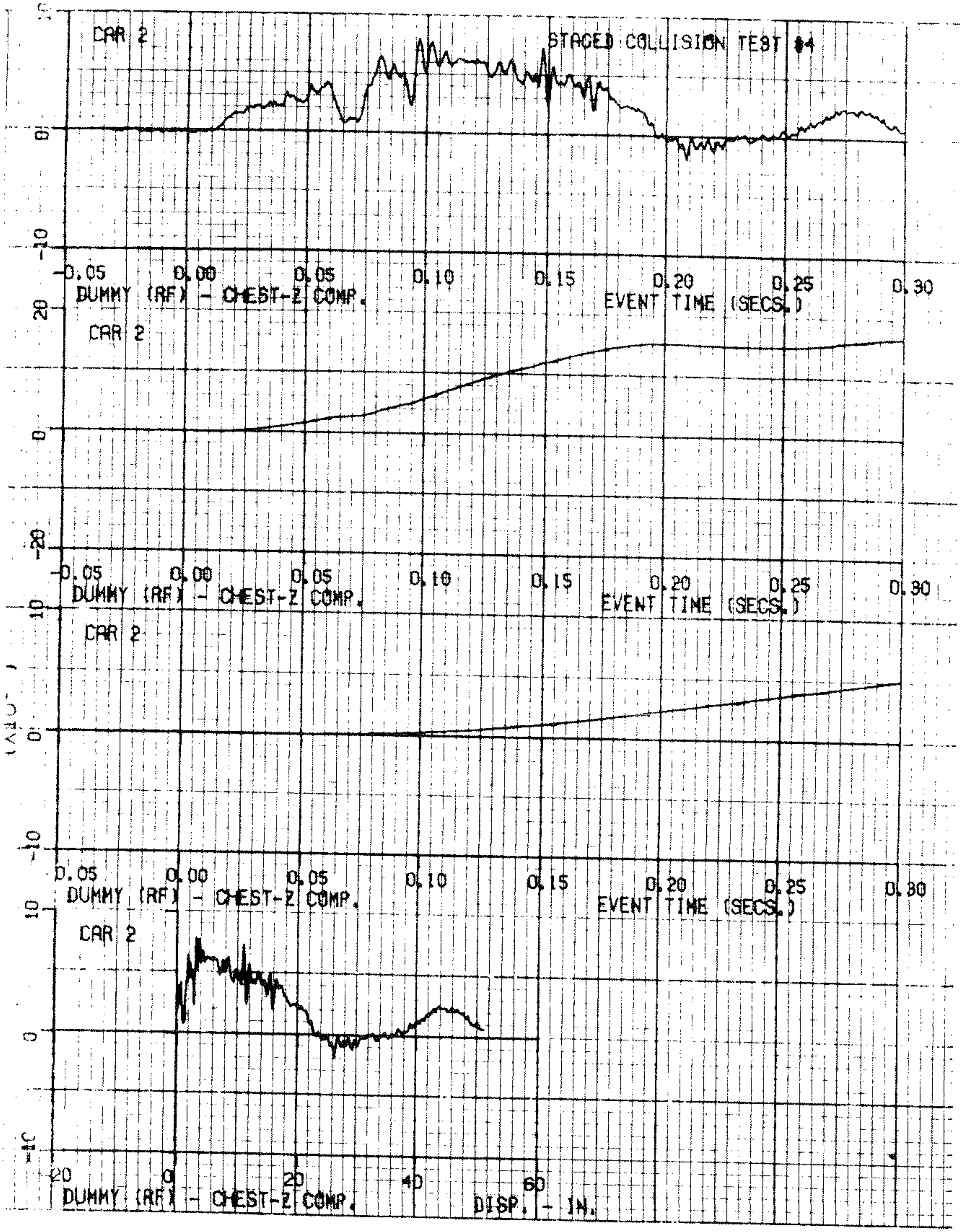

CAR 2
STAGED COLLISION TEST #4
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
10
(X10^-1)
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
20
0
-20
-40
0
40
80
120
DUMMY (RF) - CHEST-X COMP.
DISP. - IN.

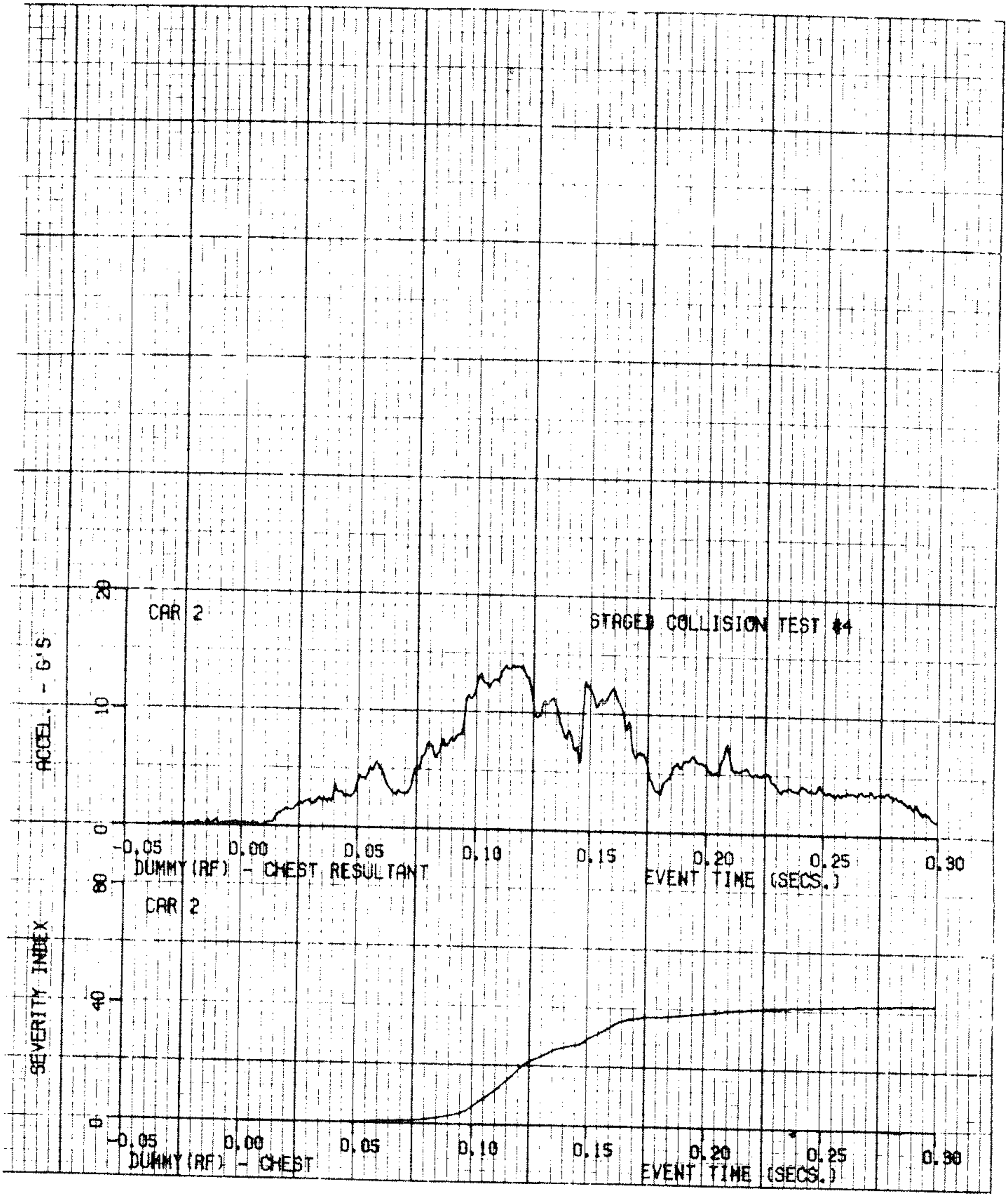
ZQ-6057-V-4

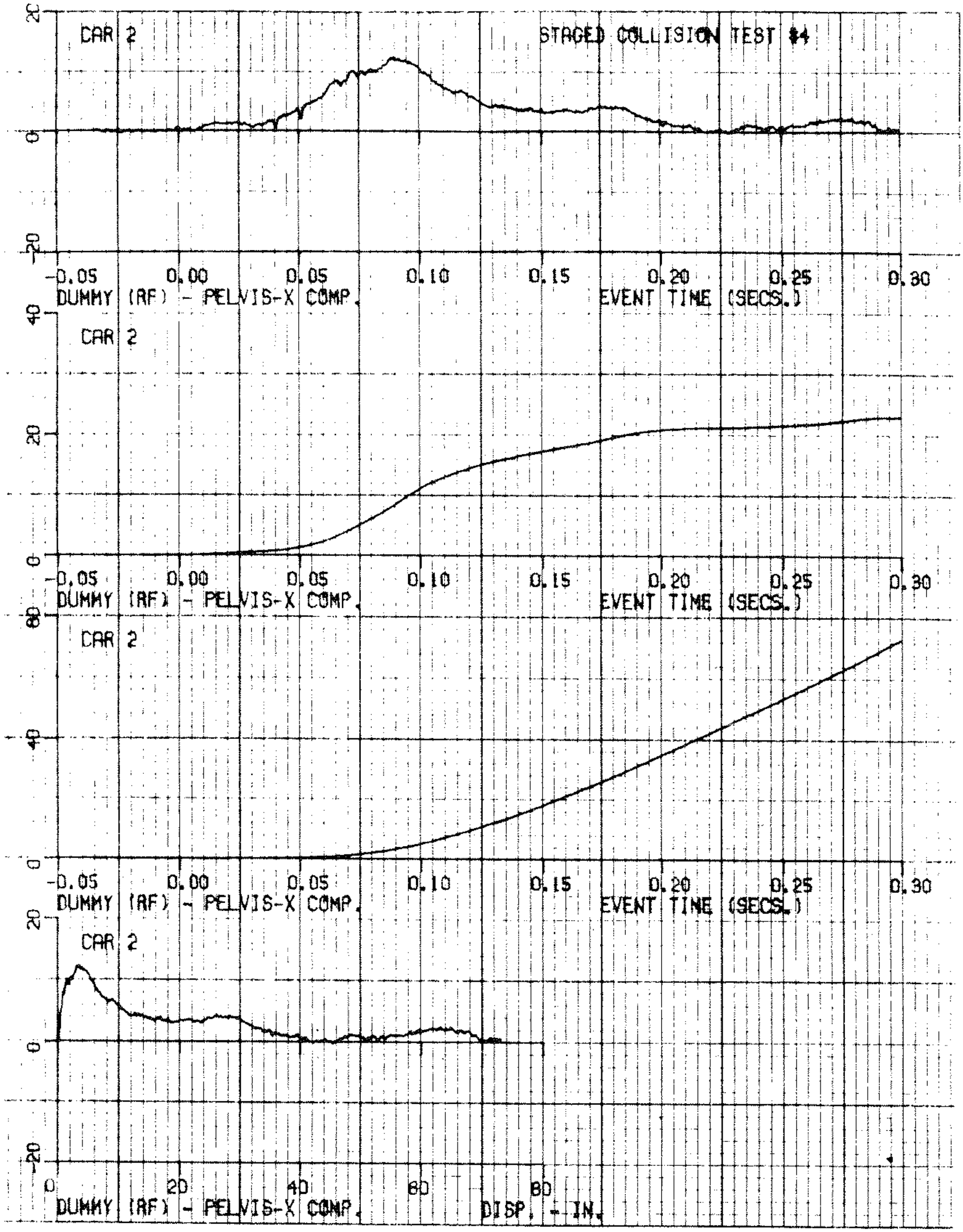


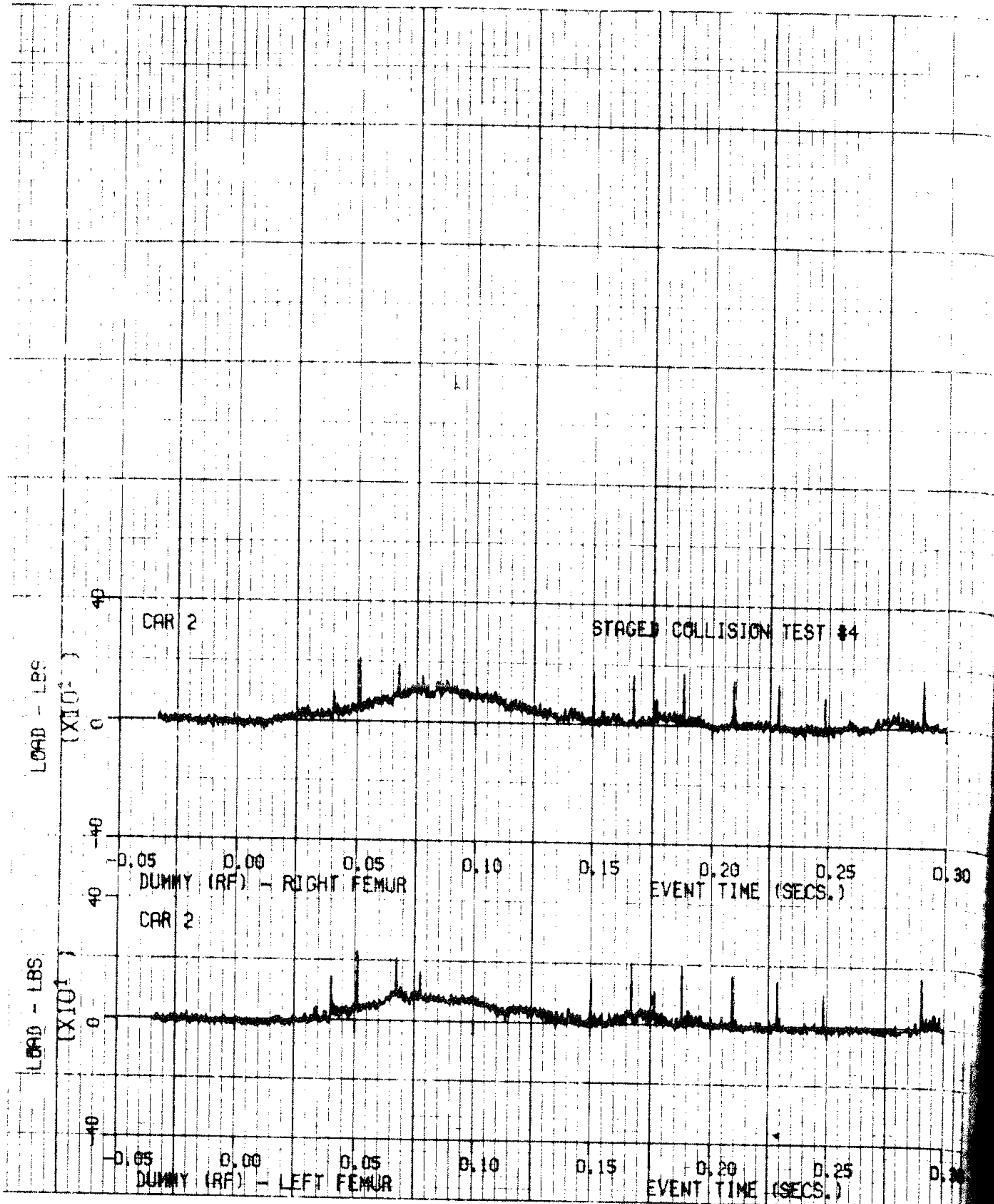
10 76

20-6057-V-4


CAR 2
STAGED COLLISION TEST #4
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
20
CAR 2
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
10
CAR 2
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
10
CAR 2
0
-10
-20
0
20
40
60
DUMMY (RF) - CHEST-Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #4
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
20
0
-20
0
20
40
60
80
DUMMY (RF) - PELVIS-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #4
LOAD - LBS (X10¹)
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - RIGHT FEMUR
EVENT TIME (SECS.)
CAR 2
LOAD - LBS (X10¹)
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
DUMMY (RF) - LEFT FEMUR
EVENT TIME (SECS.)

TEST NO. 5

RICSAC STAGED COLLISION

FRONT-TO-REAR

OBLIQUE - OFFSET

TORINO/HONDA

VELOCITY 39.7 MPH

11.0 RICSAC STAGED COLLISION - TEST NO. 5

EXPERIMENTAL RESULTS

Test Description

This staged collision involved a 1974 Ford Torino (V-1) striking the rear of a stationary 1975 Honda Civic (V-2) at an oblique 10 degree angle with a 26 inch offset as shown in Figure11-1. The impact velocity was 39.7 mph. The vehicle test weights were 4600 and 2530 pounds for the Torino and Honda, respectively. Each vehicle had two Part 572 test dummies (50th percentile) seated in the front seat. The dummies in the Honda were instrumented according to FMVSS 208 and were unrestrained. In the Torino the dummies were uninstrumented and were restrained with seat belts.

The Torino was equipped with automatic transmission, power steering and power brakes. The Honda had manual transmission, steering and power brakes. The accident was staged with both transmissions in drive position, brakes off and the engines not running. During the collision no steering control inputs or vehicle braking was applied. The roadway was dry with skid resistance value of 87.

Approximately one car length before impact the vehicle tow cable was released and the vehicle guide rail was terminated. At this point in time and during the collision both vehicles are free bodies with no constraints except the normal collision forces and reactions encountered in this type of car-to-car collision. During the collision event no observed tow cable or instrumentation cable interference with the moving vehicles was noted.

ACCIDENT SCHEMATIC

VEHICLES:

No. 1 - 1974 FORD TORINO
No. 2 - 1975 HONDA CIVIC CVCC

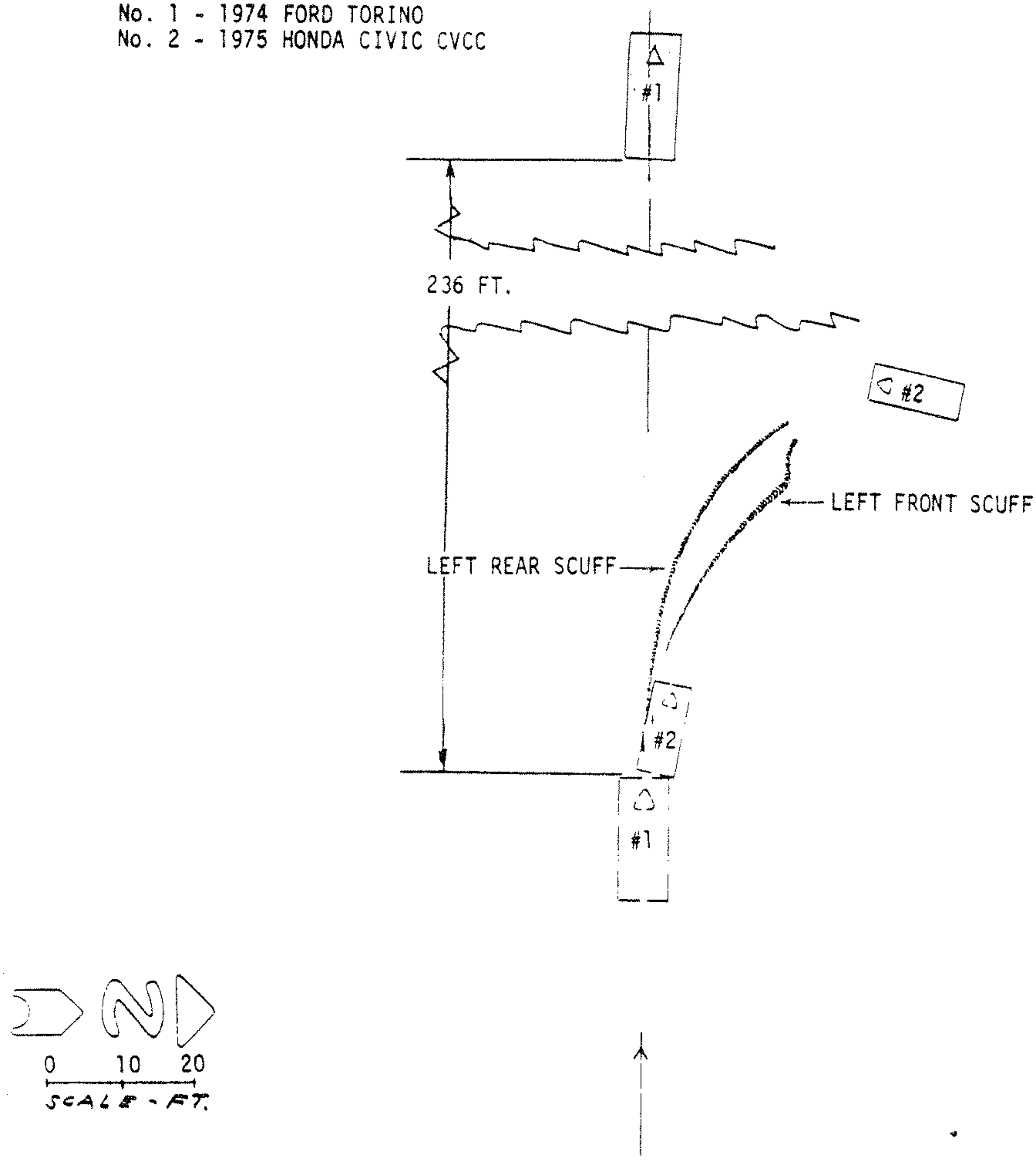


Figure 11-1 TEST NO. 5 - RICSAC ACCIDENT SCHEMATIC

CRASH TEST SUMMARY

TEST NO. 5

PROJECT Staged Car to Car Collision

DATE 5-10-78

TIME 12:15

TEMP. 48°F

TEST CONDITION Rear Oblique Offset (26 inch offset at 10 Deg.)

VEHICLE NO. 1 1974 Ford Torino

VEHICLE NO. 2 1975 Honda

	VEH. NO. 1	VEH. NO. 2
TEST WEIGHT (lbs)	4600	2530
IMPACT ANGLE (deg)*	0	10°
IMPACT VELOCITY (mph)**	39.76	0
MAX. CRUSH (in)	2.9"	36.5"
MAX. INTRUSION (in)	—	—

DUMMIES	VEH. NO. 1	VEH. NO. 2
TYPE	Part 572	Part 572
LOCATION	Driver (LF), Passenger (RF)	Driver (LF), Passenger (RF)
RESTRAINT	3-Point Restraint	Unrestrained
	(uninstrumented)	(Instrumented)

NUMBER OF DATA CHANNELS 64

NUMBER OF HIGH SPEED CAMERAS 10

*WITH RESPECT TO TOW TRACK CENTERLINE

**SPEED TRAP MEASUREMENT (±0.5% ACCURACY)

TABLE 11-1

TEST NO. 5 - CAR NO. 1
VEHICLE DATA

TEAM	YEAR	MONTH	DAY	SEQUENCE
1	8	0 5	1 0	_ _ _

Vehicle data not collected. Reason? ____

Vehicle No. 1   14-15 No. of VIN Characters 1 1

-22 VIN (Left Justify, Omit Production Numbers) 4 H 2 7 H 2 3 8327

-27 Make/Model (CPIR Code) Ford - Torino 4 Door 1 2 1 0 1

-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more 9 2 1 1 1
99999 = Unknown

-34 Model Year 7 4

-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

-39 Curb 4 0 , _ 0 0

-42 Occupant and Cargo Only _ _ , _ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

	Object Contacted	CDC	Veh. No.	Impact No.
-54 (1)	0 1	1 2 F Z E W 1	2	1
-65 (2)				
(3)				
(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ____	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2, 3, 4, 5, 6, 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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Figure 11-2

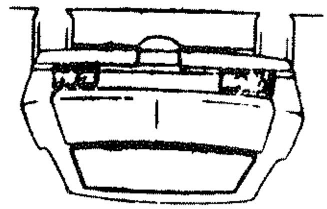
VEHICLE CRUSH SCHEMATIC
TEST NO. 5 - CAR NO. 1

DAMAGE DESCRIPTION

WHEELS LOCKED BY DAMAGE

RF 2
LF 2
RR 2
LR 2

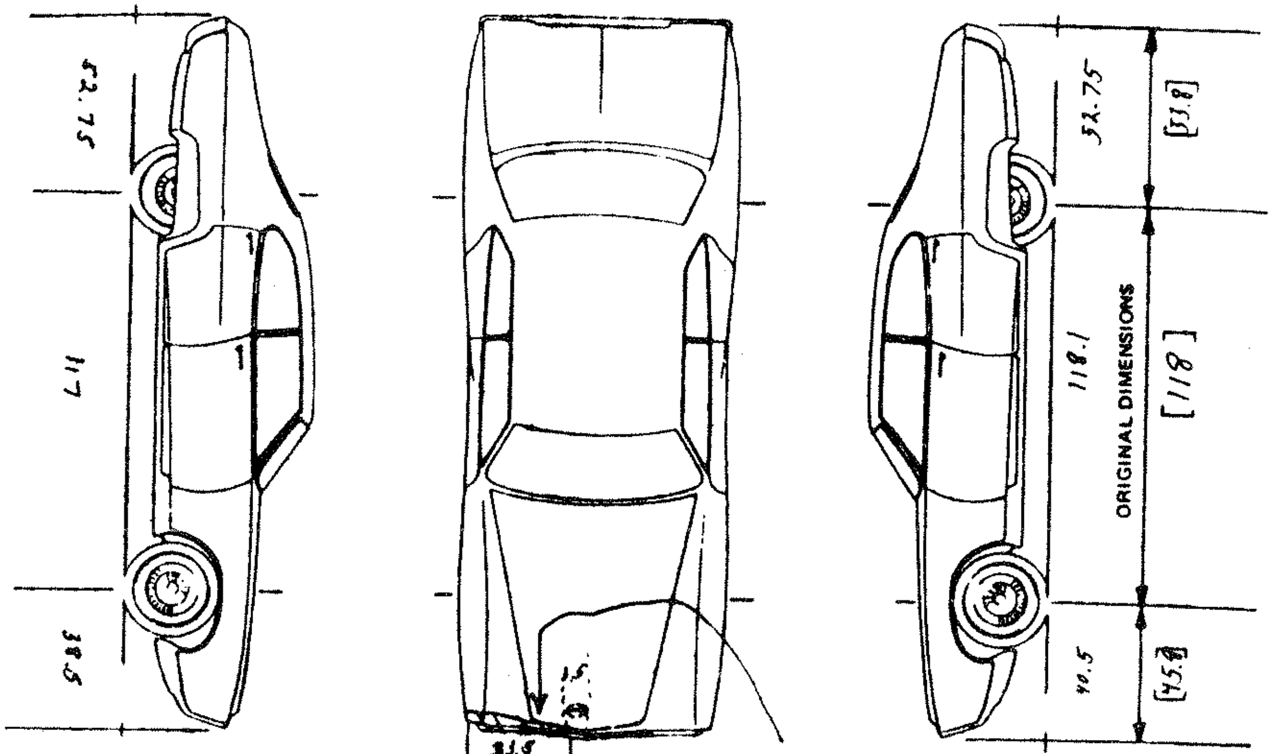
1 Yes, 2 No, 8 NA, 9 Unk.

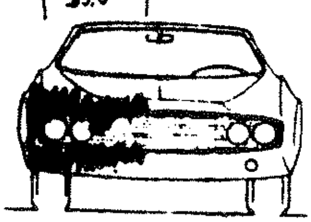


WHEEL STEER ANGLES*
(For locked front wheels or displaced rear axles only)

RF ± NA
LF ± NA
RR ± NA
LR ± NA

Within ± 5°





3½" Max crush on front cowl located 9.5" Right of center and 27½" from ground level

Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D±
1	33.5	1.4	1.4	2	2.1	2.25	2.9	20.25
2								
3								
4								

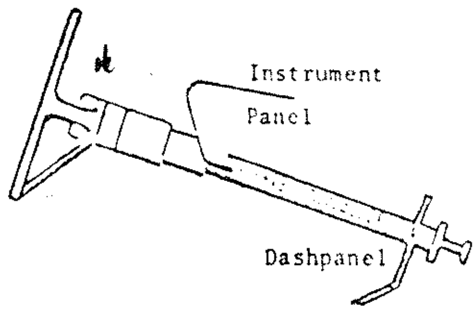
NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

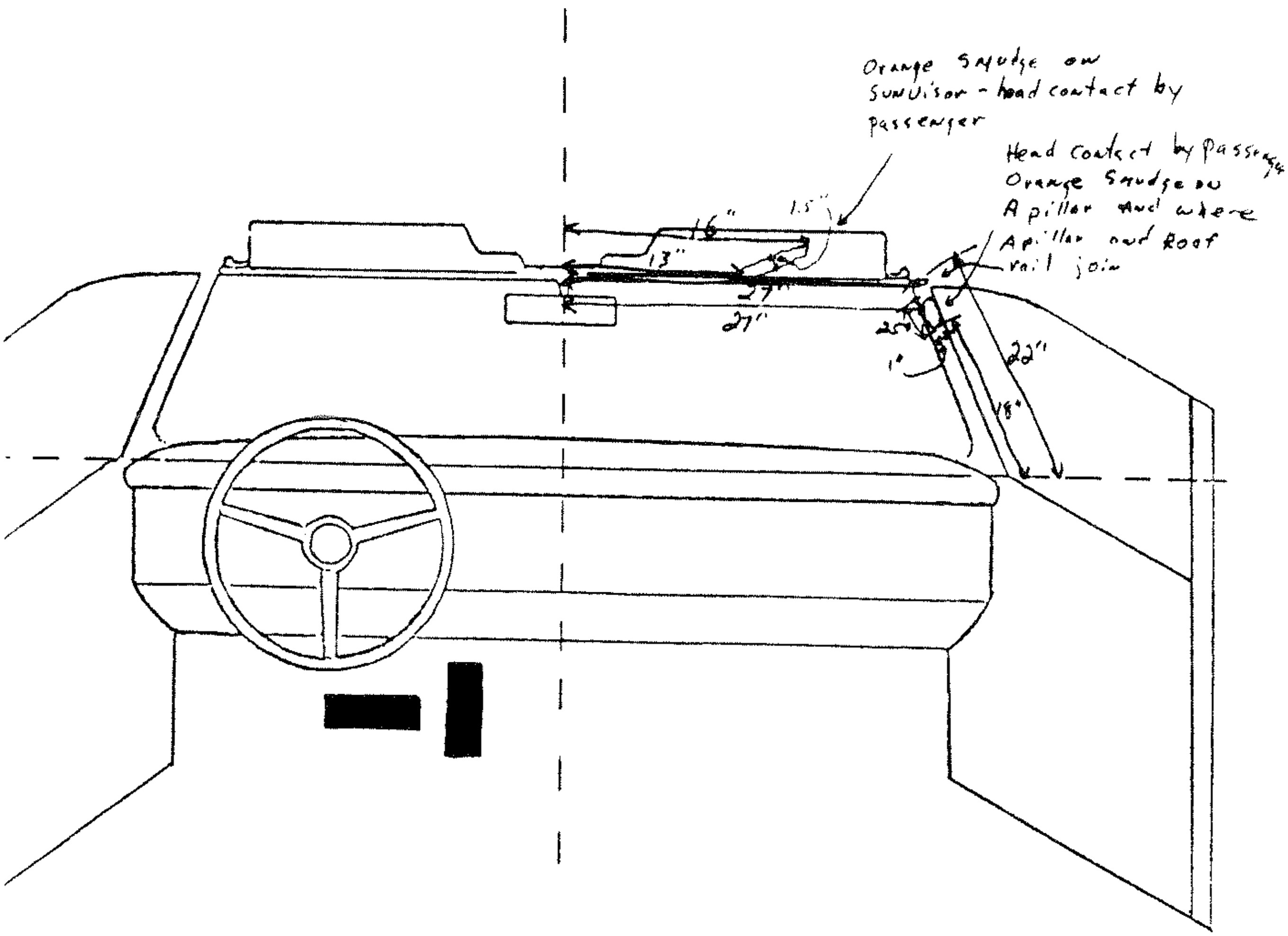
Figure 11-3
OCCUPANT CONTACT DATA

TEST NO. 5 - CAR NO. 1

VEHICLE INTERIOR

Occupant Contacts





Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

TABLE 11-2

TEAM	YEAR	MONTH		DAY		SEQUENCE
1	8	0	5	1	0	___

TEST NO. 5 - CAR NO. 2

VEHICLE DATA

Vehicle data not collected. Reason? ______

Vehicle No. 2

14-15 No. of VIN Characters 1 0

16-22 VIN (Left Justify, Omit Production Numbers) SG-A 1 0 1 6 3 8 1

23-27 Make/Model (CPIR Code) Honda Civic CVCC 8 8 1 0 9

28-32 Mileage (Odometer Reading) 99998 = 99998 mi. or more
99999 = Unknown ___ ___ ___ ___ ___

33-34 Model Year 7 5

35-36 BODY STYLE

Automobiles		Trucks		Other	
Passenger Car	01	Van - Passenger	05	School Bus	11
Stationwagon	02	- Cargo	06	Other Bus	12
Convertible	03	Multi-Purpose	07	Motorcycle	13
Car, pickup body (e.g., El Camino, Ranchero, etc.)	04	Pickup	08	Other Body Style	98
		Straight Truck	09	Unknown	99
		Tractor-Trailer	10		

VEHICLE WEIGHT

37-39 Curb 1,7 0 0

40-42 Occupant and Cargo Only ___ ___,___ 0 0

43 TOWING ANOTHER VEHICLE

Yes	1
No	2
Unknown	9

VEHICLE DAMAGE

		Object Contacted	CDC	Veh. No.	Impact No.
44-54	(1)	0 3	0 5 B D E W 8	1	1
55-65	(2)				
	(3)				
	(4)				

(1) = Highest Severity (Estimated ΔV)

66 VEHICLE TOWED FROM SCENE

Yes	1
No	2
Unknown	9

67 SOURCE OF VEHICLE DATA

Inspection at Repair or Tow Facility	1
Inspection at Person's Home	2
Inspection at Scene	3
Not Inspected (Photos or Repair Data)	4
Not Inspected. Reason. ______	5
Unknown	9

68 VEHICLE INSPECTION

Not Inspected	0
Inspected on First Visit	1
Actual Number of Locations Visited (Including Follow-Ups to Same Location)	2 3 4 5 6 7
8 or More	8
Unknown	9

69 APPLICABLE VEHICLE

Yes	1
No	2

NOTE: COLUMN NUMBERS FROM THE SUMMARY VEHICLE DATA FORM ARE LISTED ON THE LEFT IN THIS FORM TO SIMPLIFY TRANSFER OF DATA.

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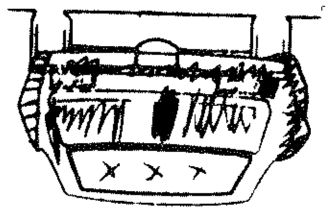
Figure 11- 4

VEHICLE CRUSH SCHEMATIC
TEST NO. 5 - CAR NO. 2

GE DESCRIPTION
EELS LOCKED BY DAMAGE

RF 2
LF 2
RR 1
LR 1

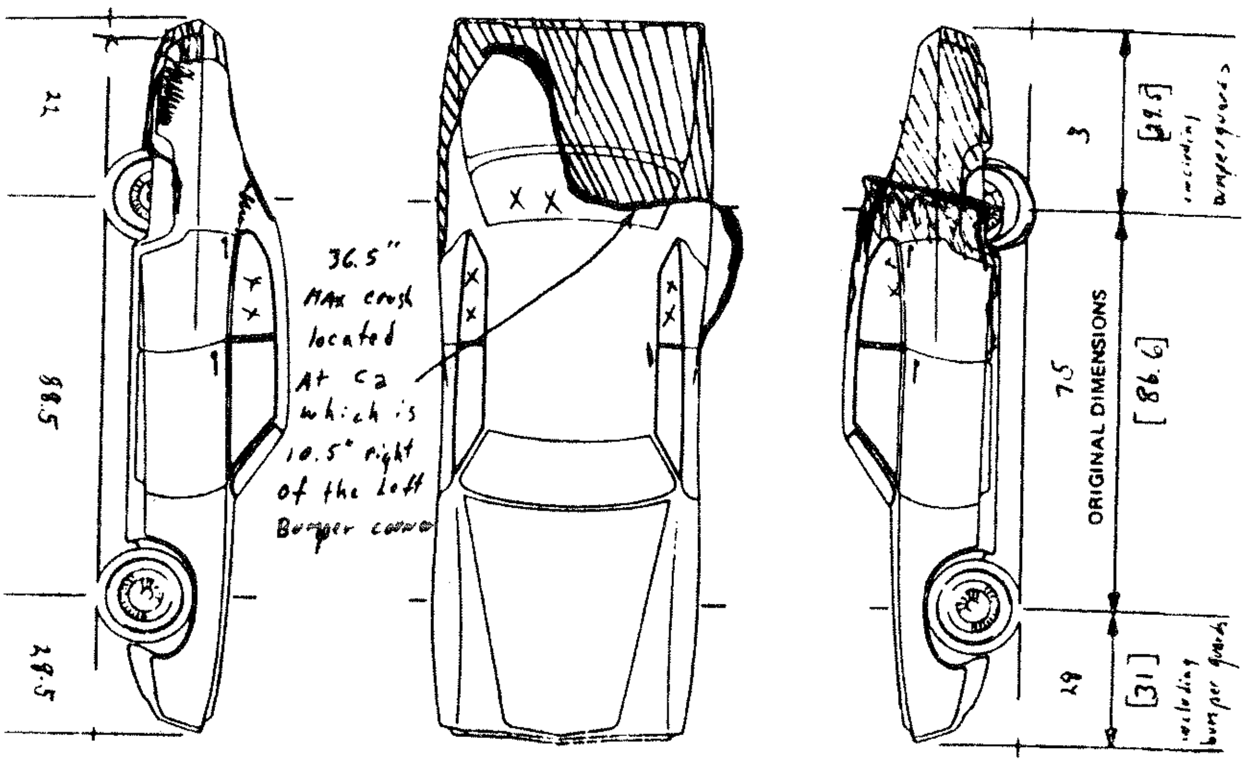
Yes, 2 No, 8 NA, 9 Unk.

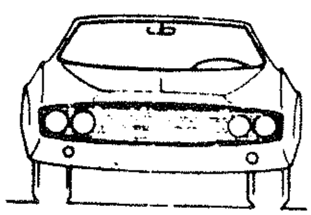


Contact begins 24.9" Right of center of an undamaged bumper

WHEEL STEER ANGLES*
(For locked front wheels or displaced rear axles only)

RF ± N A
LF ± N A
RR ⊕ 2 5 Within ± 5°
LR ⊕ 0 4





Impact Number	L	C_1	C_2	C_3	C_4	C_5	C_6	D+
1	53	36	36.5	31.5	23	17.25	6	-1.6
2								
3								
4								

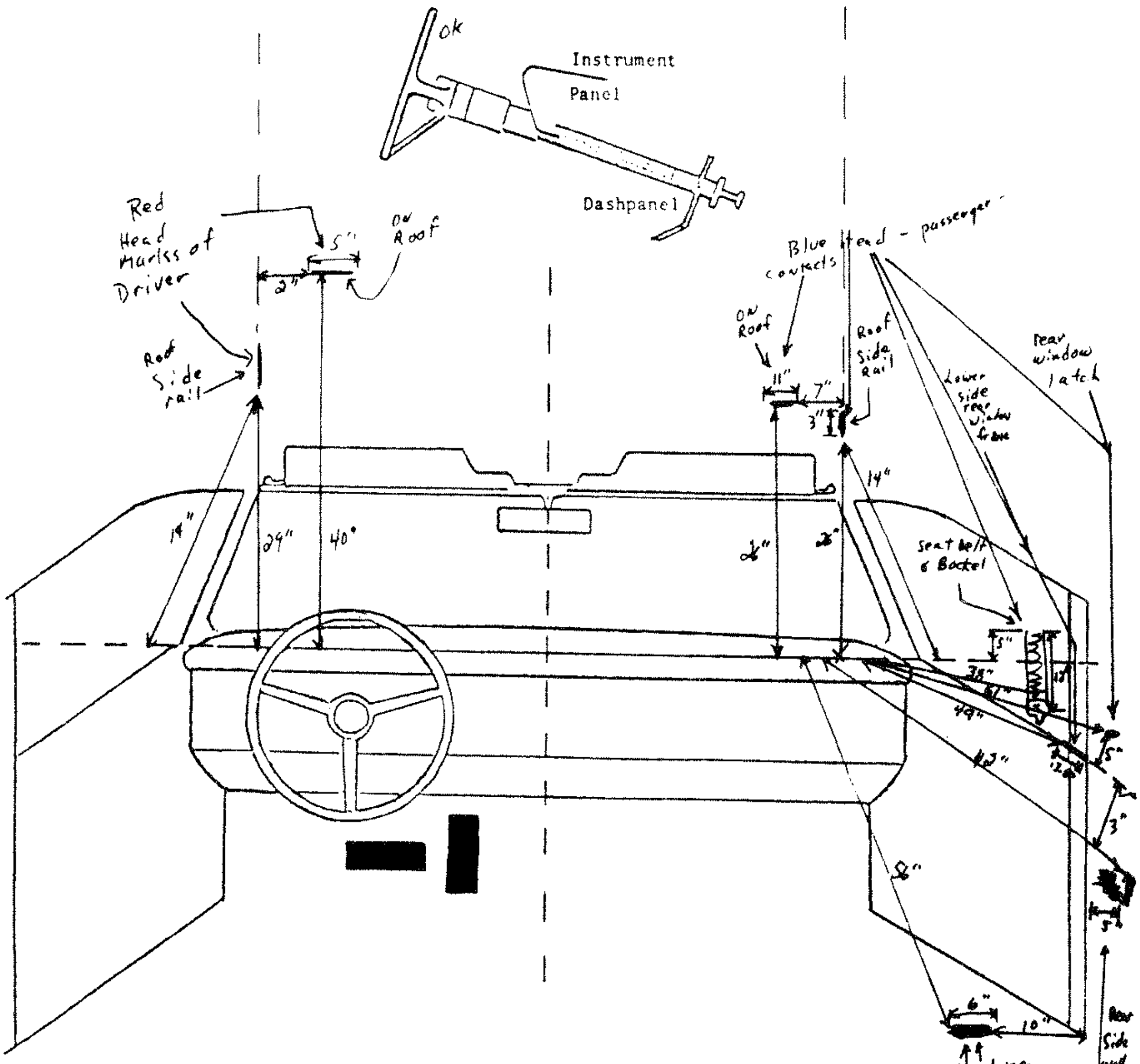
NOTE: MEASURE C_1 TO C_6 FROM: DRIVER TO PASSENGER SIDE IN FRONT OR REAR IMPACTS: REAR TO FRONT IN SIDE IMPACTS

Figure 11-5

OCCUPANT CONTACT DATA
TEST NO. 5 - CAR NO. 2

VEHICLE INTERIOR

Occupant Contacts



Sketch controls in appropriate positions, if contacted. Sketch all occupant contact points and code on next two pages. Dash lines indicate center of instrument panel-windshield area and top of panel for measurement purposes.

Blue Head contacts by Passenger

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See Reverse Side for Seat Contact information

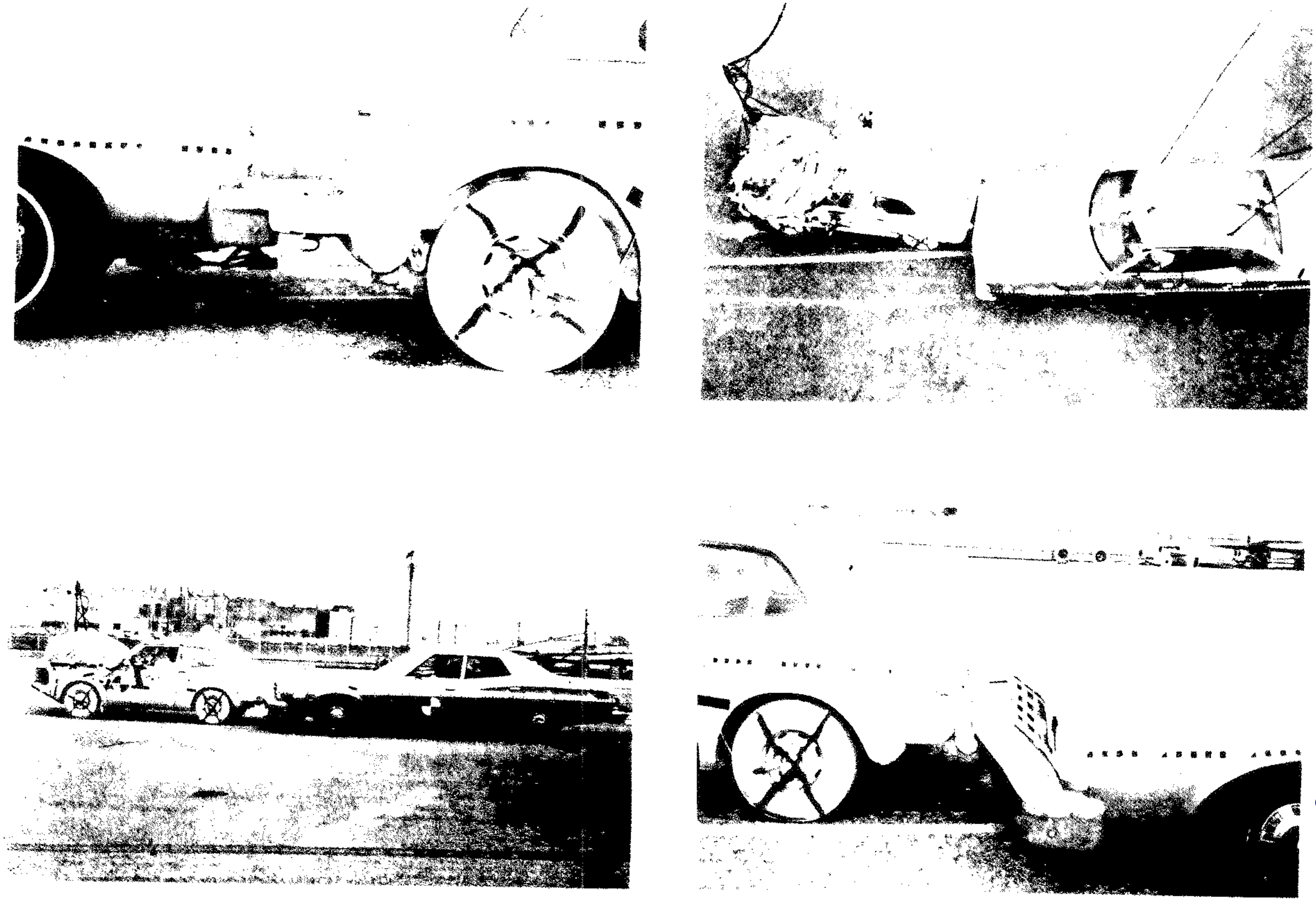

Figure 11-6 TEST NO. 5 — PRE TEST COLLISION CONFIGURATION

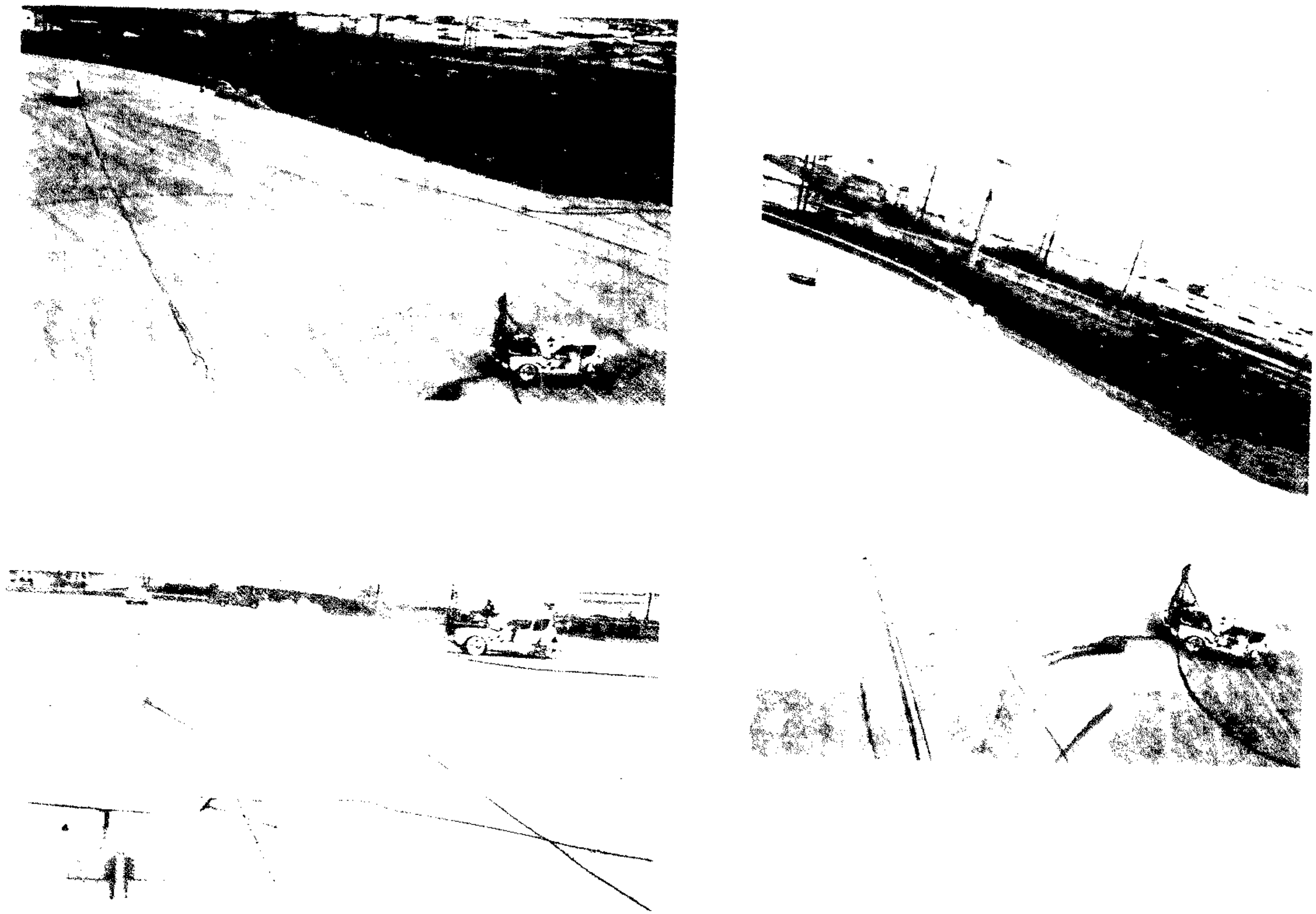

Figure 11-7 TEST NO. 5 – POST TEST COLLISION SCENE

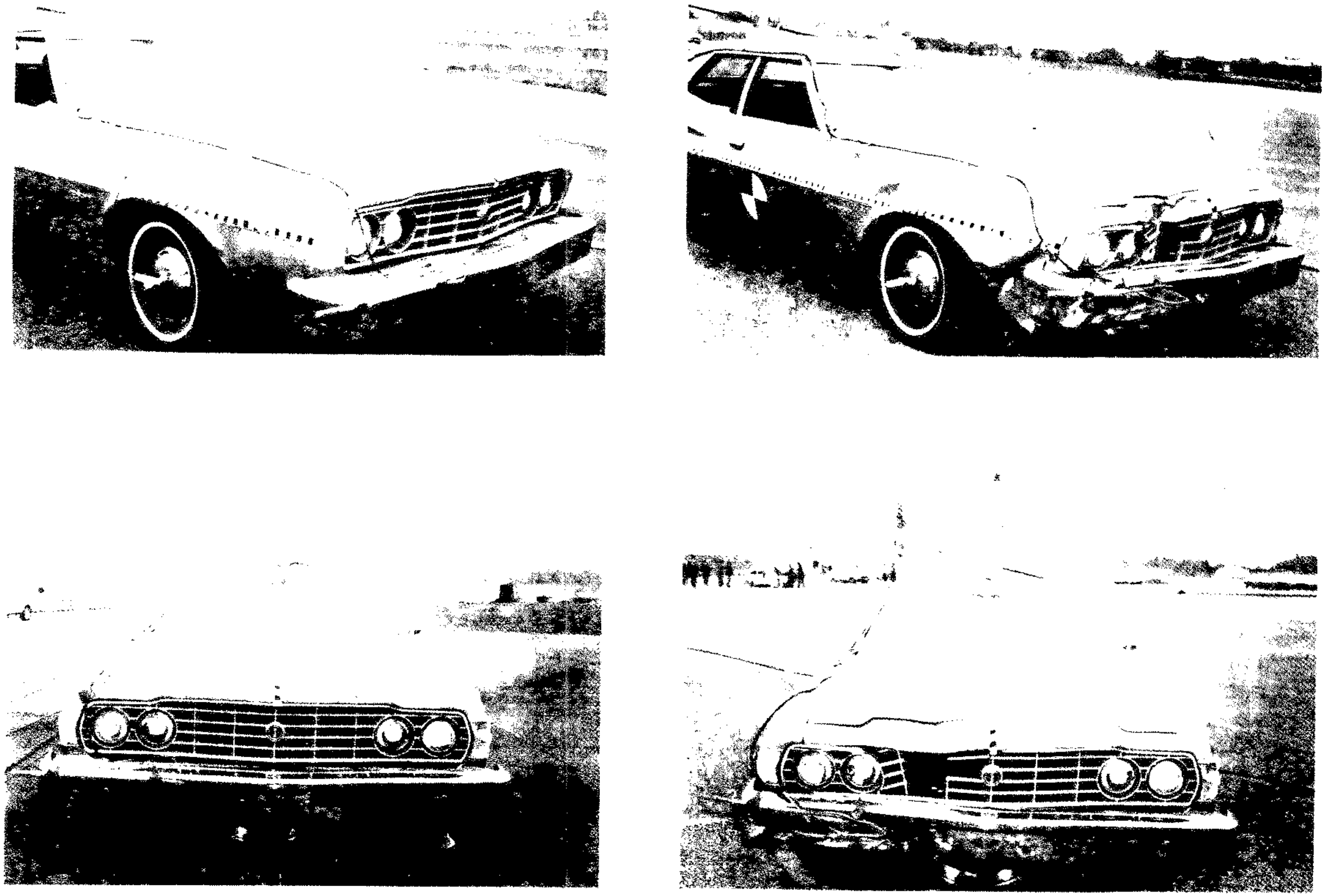

Figure 11-8 TEST NO. 5 – PRE AND POST EXTERIOR VIEWS, CAR NO. 1 - TORINO

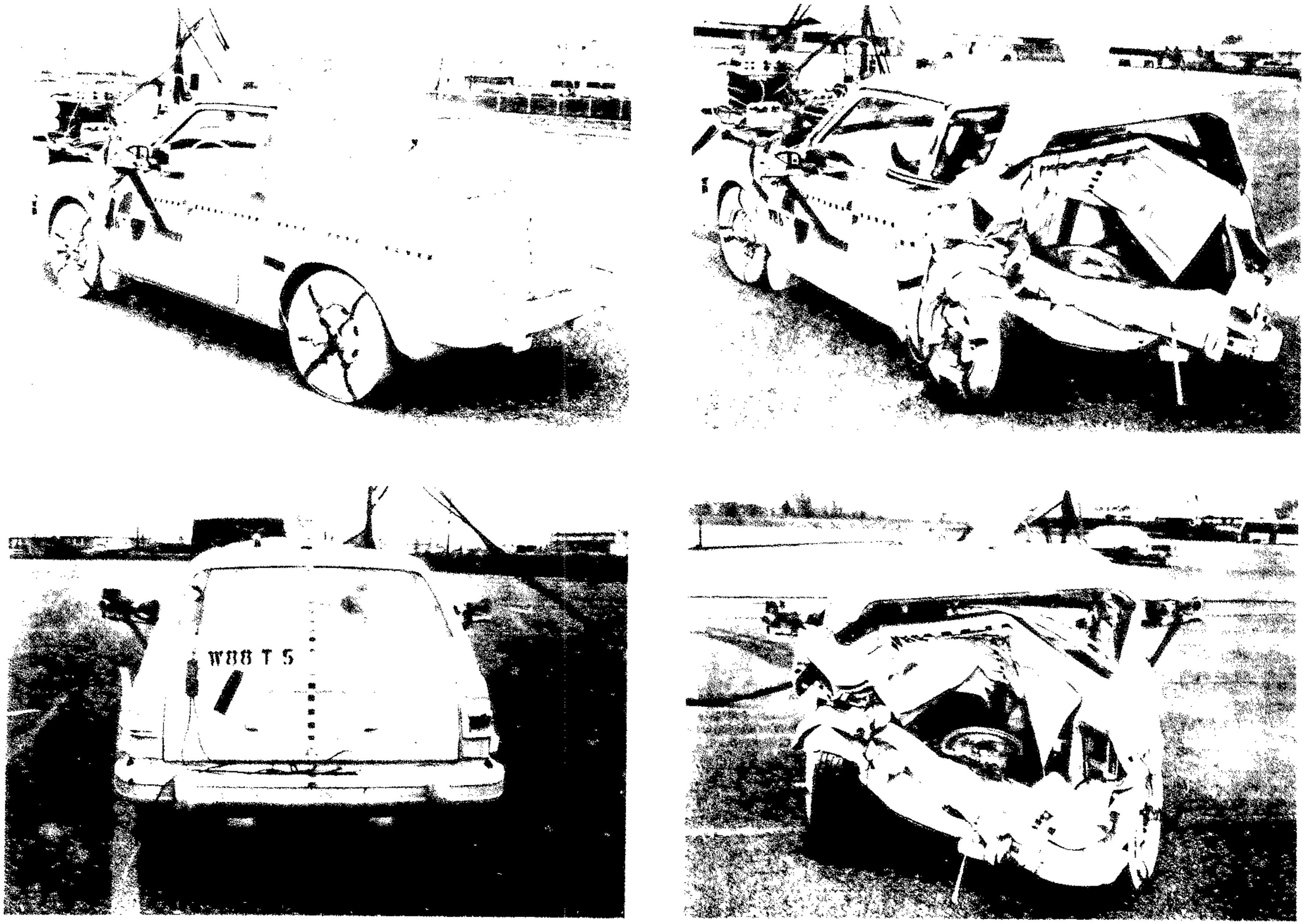

Figure 11-9 TEST NO. 5 — PRE AND POST EXTERIOR REAR VIEWS, CAR NO. 2 - HONDA

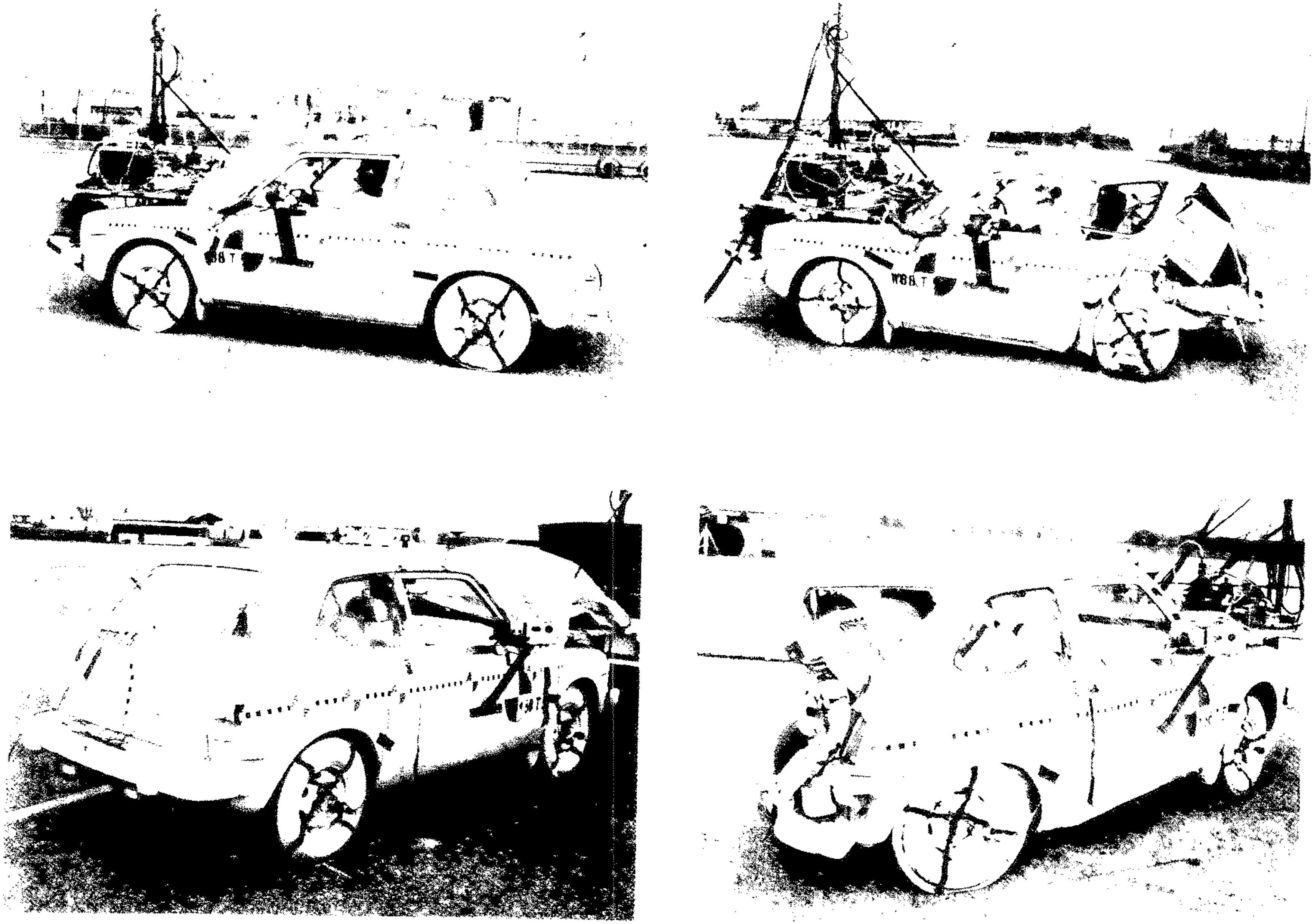

Figure 11-10 TEST NO. 5 — PRE AND POST EXTERIOR SIDE VIEWS, CAR NO. 2 - HONDA

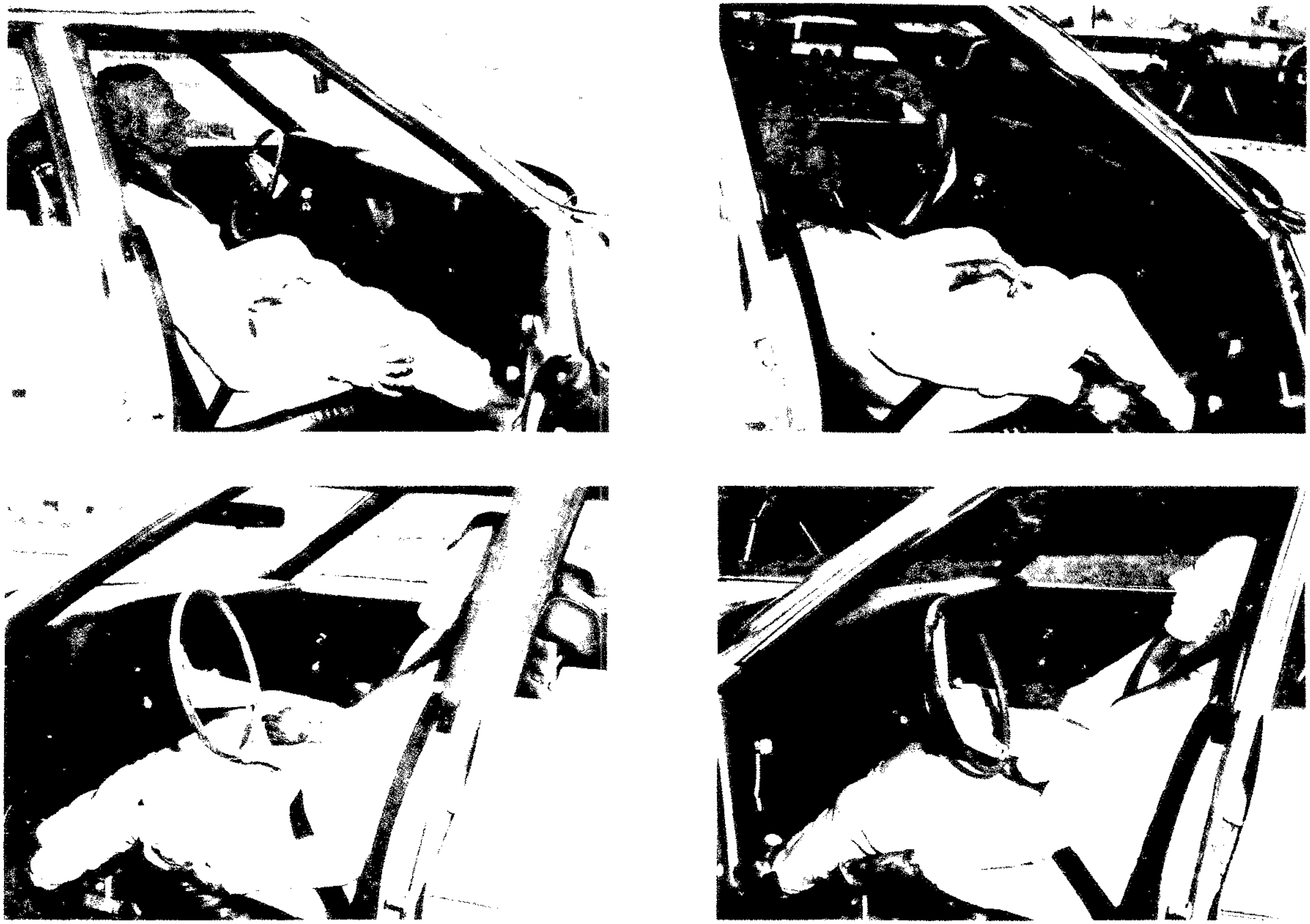

Figure 11-11 TEST NO. 5 — PRE AND POST INTERIOR VIEWS, CAR NO. 1 - TORINO

Figure II-12 TEST NO. 5 — PRE AND POST INTERIOR VIEWS, CAR NO. 2 · HONDA

TABLE 11-3

ELECTRONIC INSTRUMENTATION TEST No. 5

BULLET VEHICLE - CAR 1 - 1974 FORD TORINO

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	Left Front Corner
2	X,Y,Z	Floorpan R.R. Corner	Right Rear Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Rear Deck	Rear Deck
5	X	Bumper	Bumper
VEHICLE ATTITUDE			
Pitch Angle - 6		Gyro Package	Vehicle Pitch Angle
Roll Angle - 6		Gyro Package	Vehicle Roll Angle
Yaw Angle - 6		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 6		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle - Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.R. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
7	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 11-13 VEHICLE INSTRUMENTATION LOCATIONS

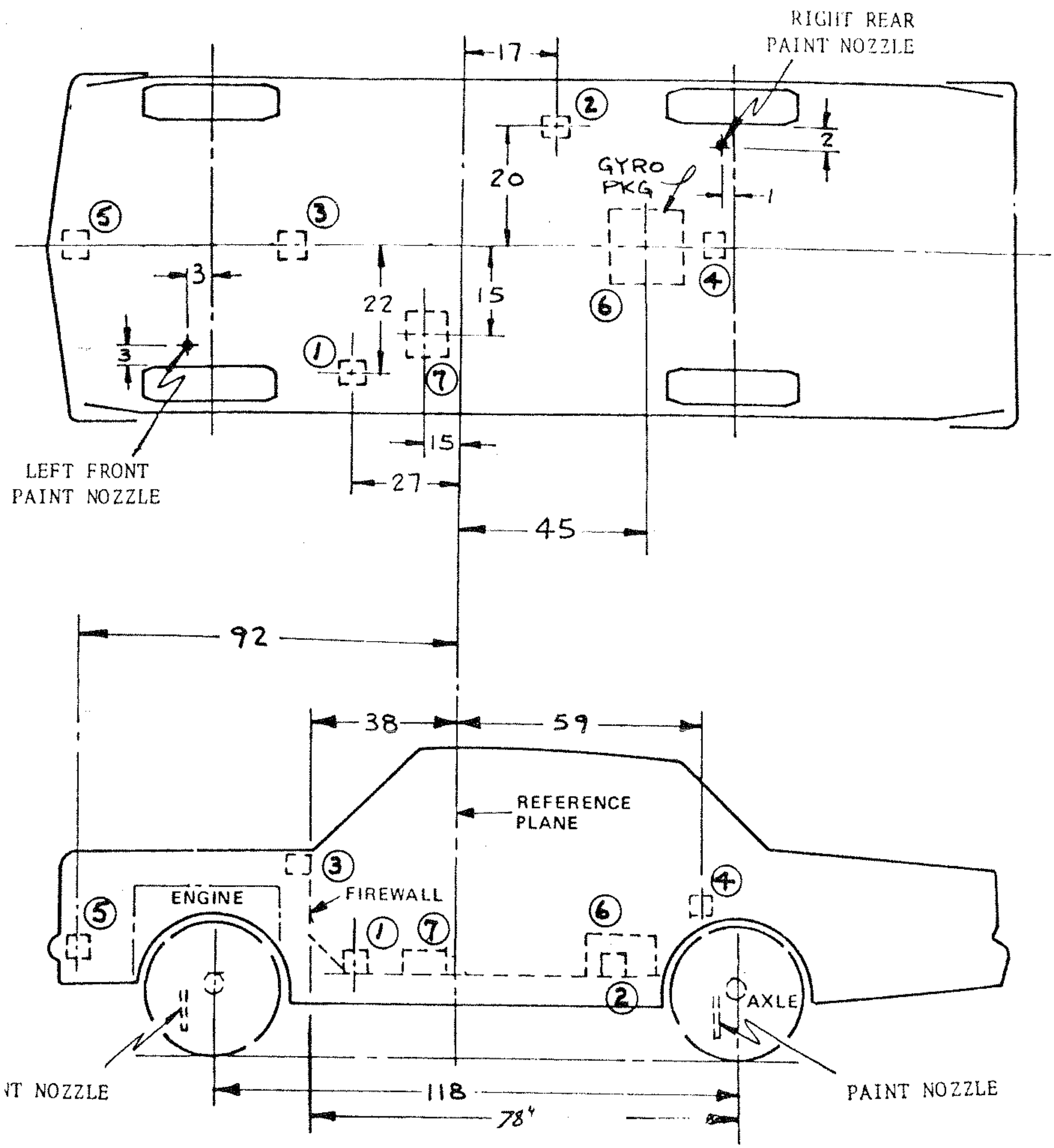

Figure 11-13 VEHICLE INSTRUMENTATION LOCATIONS

CAR 1 - 1974 FORD TORINO - TEST NO. 5

TABLE 11-4

ELECTRONIC INSTRUMENTATION TEST No. 5

TARGET VEHICLE - CAR 2 - 1975 HONDA

TRANSDUCER DESCRIPTION OR ACCELEROMETER LOCATION *	DIRECTION OF PARAMETER BEING MEASURED	LOCATION ON VEHICLE	DESCRIPTION LISTED ON DATA PLOTS
VEHICLE ACCELEROMETER			
1	X,Y,Z	Floorpan L.F. Corner	L.F. Corner
2	X,Y,Z	Floorpan L.R. Corner	R.F. Corner
3	X,Y,Z	Firewall	Firewall
4	X,Y,Z	Rear Deck	Rear Deck
VEHICLE ATTITUDE			
Pitch Angle - 5		Gyro Package	Vehicle Pitch Angle
Roll Angle - 5		Gyro Package	Vehicle Roll Angle
Yaw Angle - 5		Gyro Package	Vehicle Yaw Angle
Yaw Rate Angle - 5		Gyro Package	Vehicle Yaw Rate
Steer Angle		Front Wheels	Steer Angle - Front Wheels
R.F. Wheel Velocity		R.F. Wheel Axle	R.F. Wheel Velocity
L.F. Wheel Velocity		L.F. Wheel Axle	L.F. Wheel Velocity
R.R. Wheel Velocity		R.R. Wheel Axle	R.R. Wheel Velocity
L.F. Wheel Velocity		L.R. Wheel Axle	L.R. Wheel Velocity
DUMMY			
L.F. Head	X,Y,Z	L.F. Seat	Dummy L.F. Head
L.F. Chest	X,Y,Z	L.F. Seat	Dummy L.F. Chest
L.F. Femurs	R,L**	L.F. Seat	Dummy L.F. Femur
L.F. Pelvic	X	L.F. Seat	Dummy L.F. Pelvic
R.F. Head	X,Y,Z	R.F. Seat	Dummy R.F. Head
R.F. Chest	X,Y,Z	R.F. Seat	Dummy R.F. Chest
R.F. Femurs	R,L**	R.F. Seat	Dummy R.F. Femur
R.F. Pelvic	X	R.F. Seat	Dummy R.F. Pelvic
6	CRASH RECORDER UNDER FRONT SEAT		

*SEE FIGURE 11-14 VEHICLE INSTRUMENTATION LOCATIONS

**[illegible]

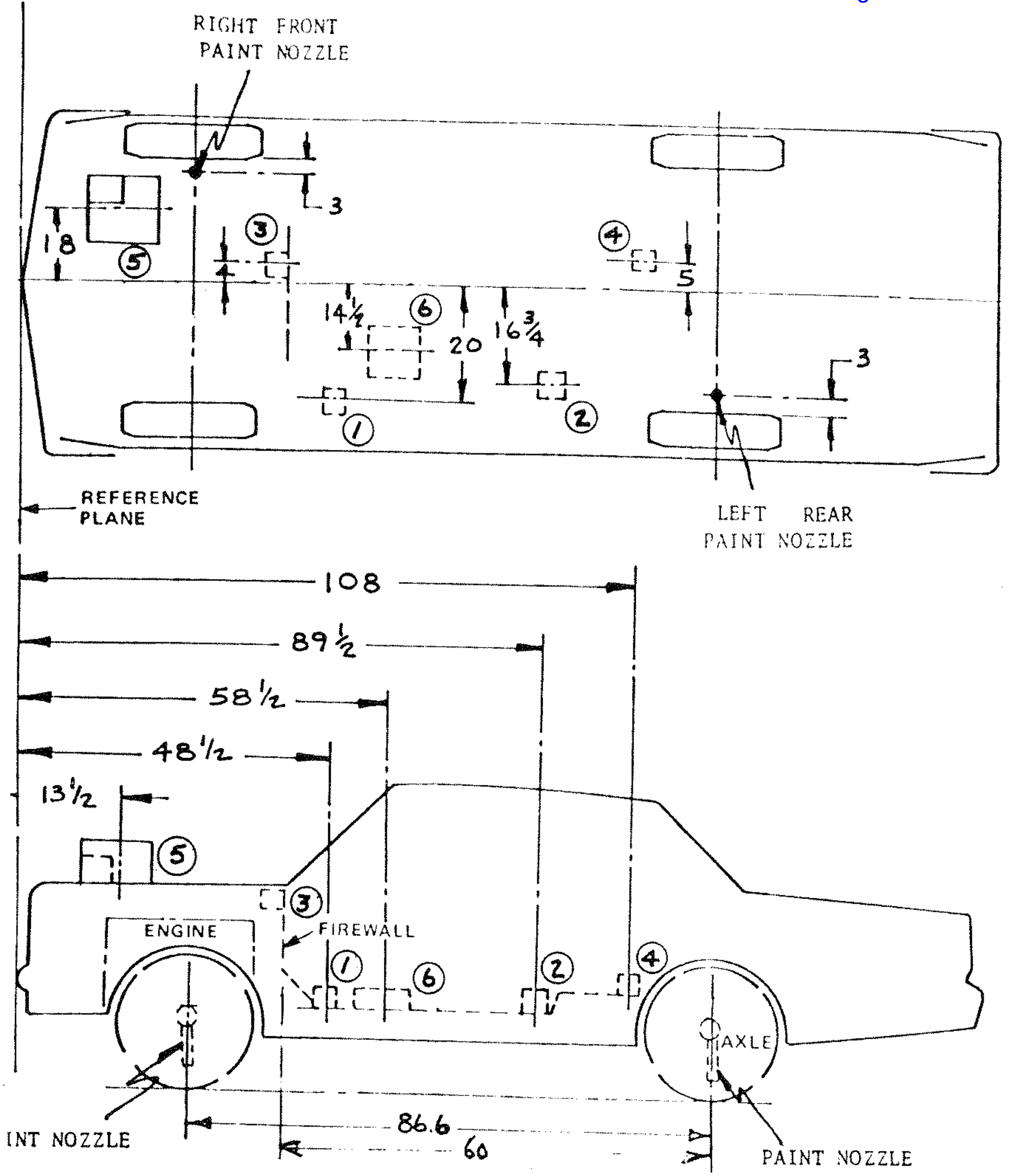

Figure 11-14 VEHICLE INSTRUMENTATION LOCATIONS

CAR NO. 2 - 1975 HONDA - TEST NO. 5

TABLE II-5

VEHICLE TEST WEIGHTS - TEST NO. 5

CAR 2 - Target - 1975 Honda

Left Front	730 lbs.	Left Rear	550 lbs.
Right Front	720 lbs.	Right Rear	530 lbs.
Total Front	1450 lbs.	Total Rear	1080 lbs.

Total Weight = 1450 lbs. + 1080 lbs. = 2530 lbs.

Wheel Base 87 in.

$Cg_{FW} = \frac{1080 \text{ lbs.}}{2530 \text{ lbs.}}$ 87 in. = 37.1 in.

CAR 1 - Bullet - 1974 Torino

Left Front	1265 lbs.	Left Rear	1065 lbs.
Right Front	1165 lbs.	Right Rear	1105 lbs.
Total Front	2430 lbs.	Total Rear	2170 lbs.

Total Weight = 2430 lbs. + 2170 lbs. = 4600 lbs.

Wheel Base 118.5 in.

$Cg_{FW} = \frac{2170 \text{ lbs.}}{4600 \text{ lbs.}}$ 118.5 in. = 55.9 in.

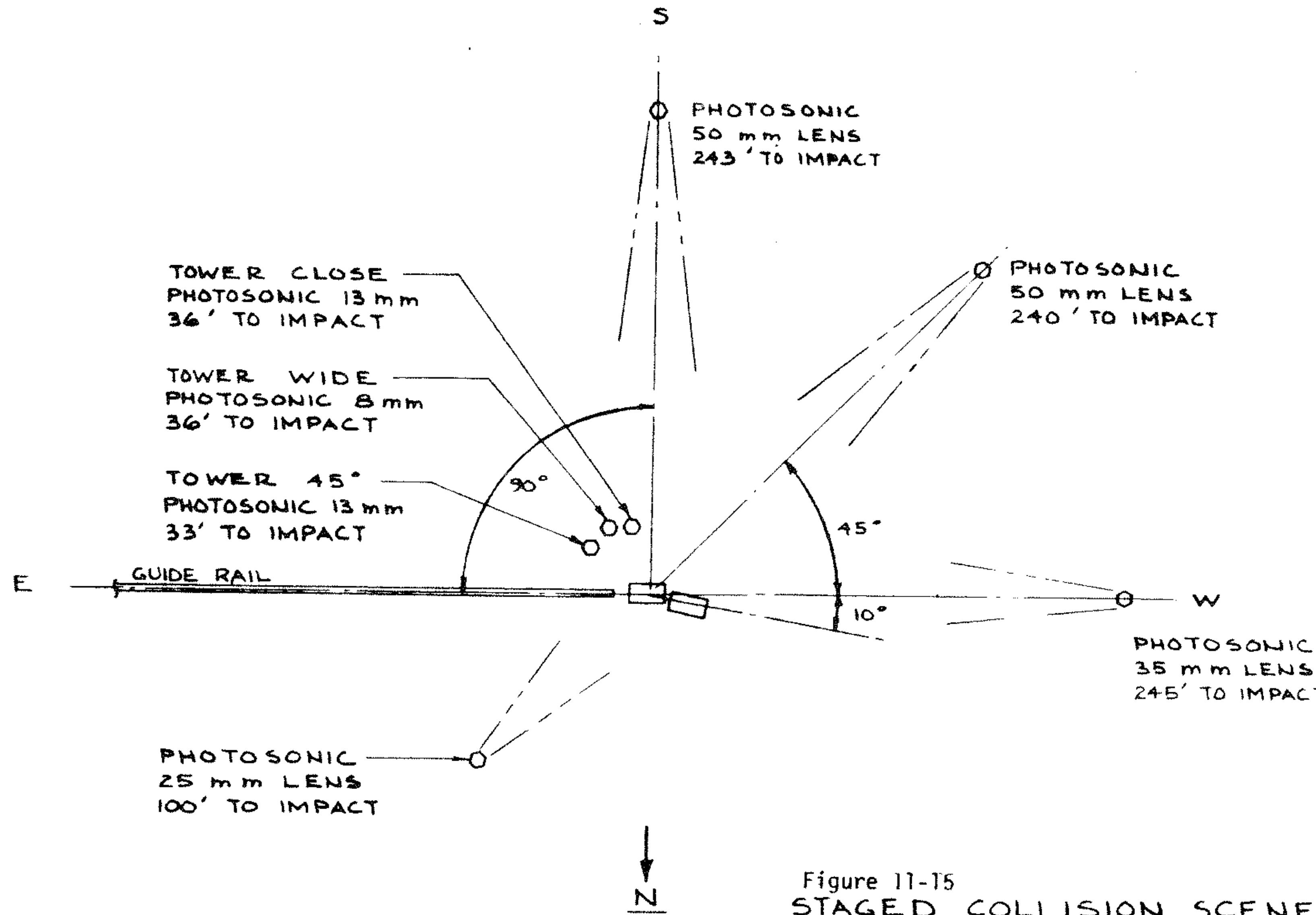

Figure 11-15
STAGED COLLISION SCENE
& CAMERA LOCATIONS
TESTS 3, 4 & 5

TABLE 11-6

HIGH SPEED CAMERA INFORMATION (TEST NO. 5)

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)
1	NORTHEAST	PHOTOSONIC	25 MM	660
2	SOUTH	PHOTOSONIC	50 MM	750
3	SOUTHWEST	PHOTOSONIC	50 MM	725
4	WEST	PHOTOSONIC	35 MM	730
5	TOWER 45	PHOTOSONIC	13 MM	710
6	TOWER CLOSE	PHOTOSONIC	13 MM	500
7	TOWER WIDE	PHOTOSONIC	8 MM	500
8	O. B. DRIVER	STALEX	8 MM	700
9	O. B. HOOD	STALEX	8 MM	800
10	O. B. PASS	STALEX	8 MM	1000

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.

(24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH AND CRASH EVENT SPLICED AT START AND END OF FILM.

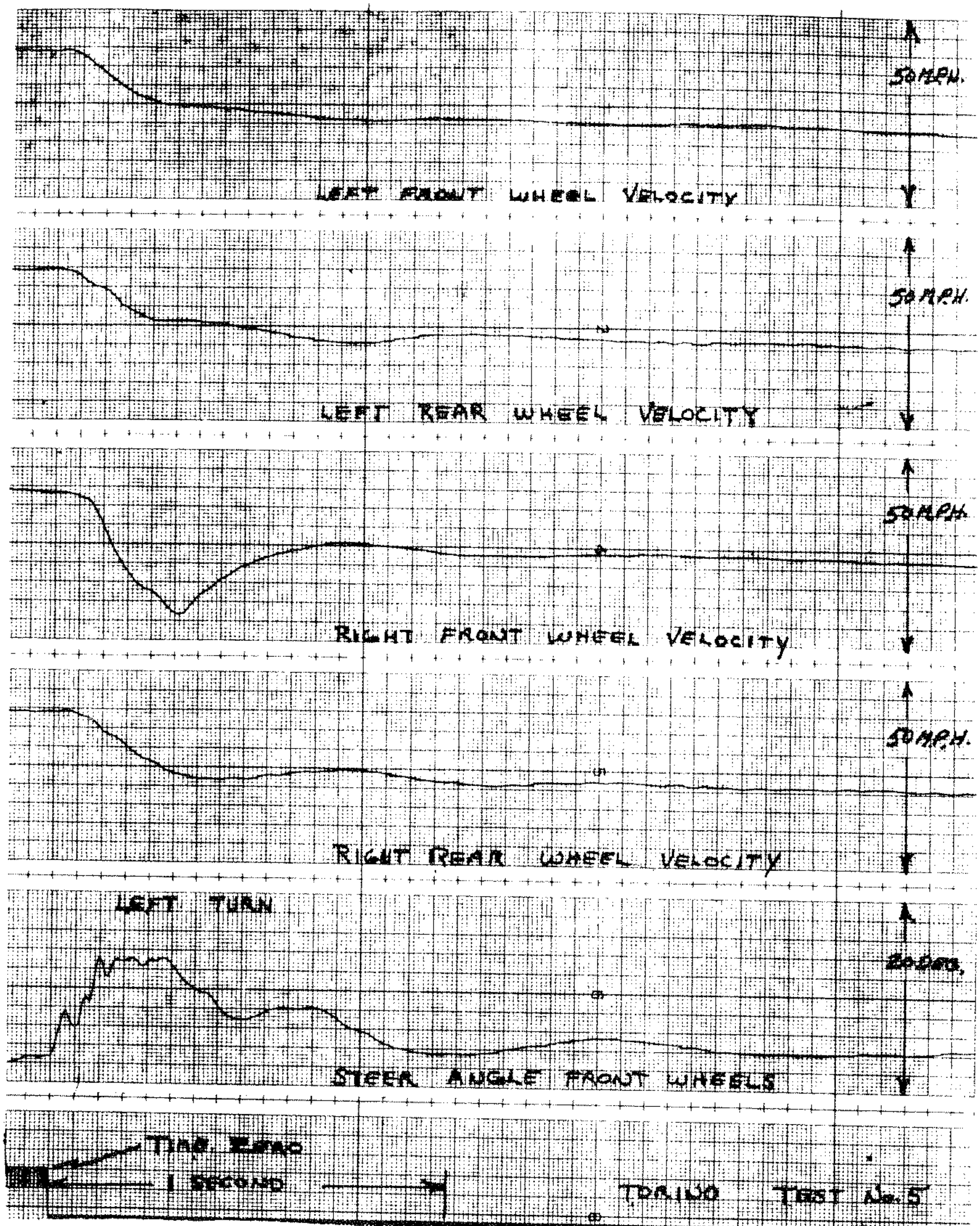

Figure 11-16 TEST NO. 5
CAR NO. 1 WHEEL RESPONSES

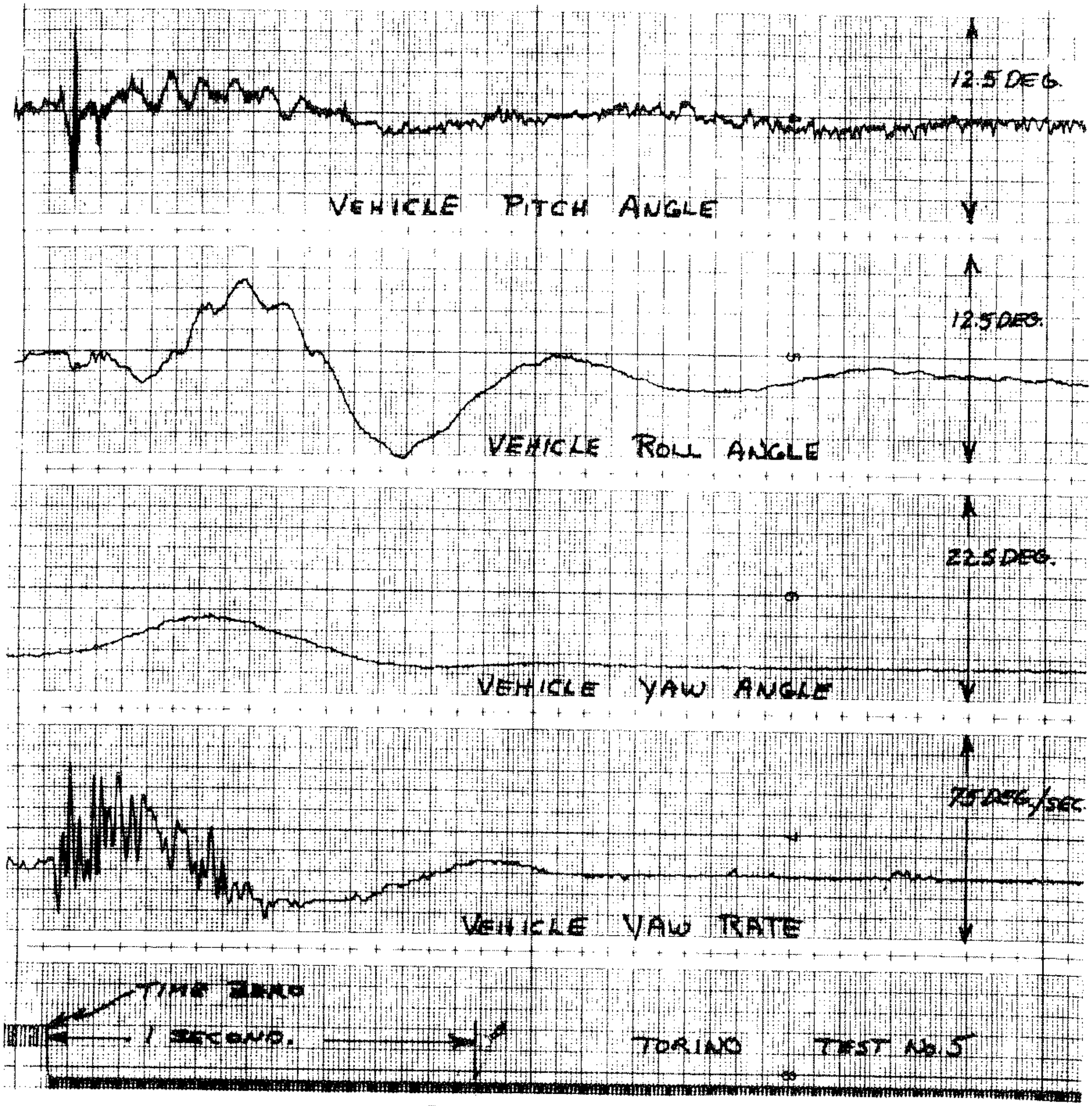

Figure 11-17 TEST NO. 5
CAR NO. 1 VEHICLE ATTITUDE

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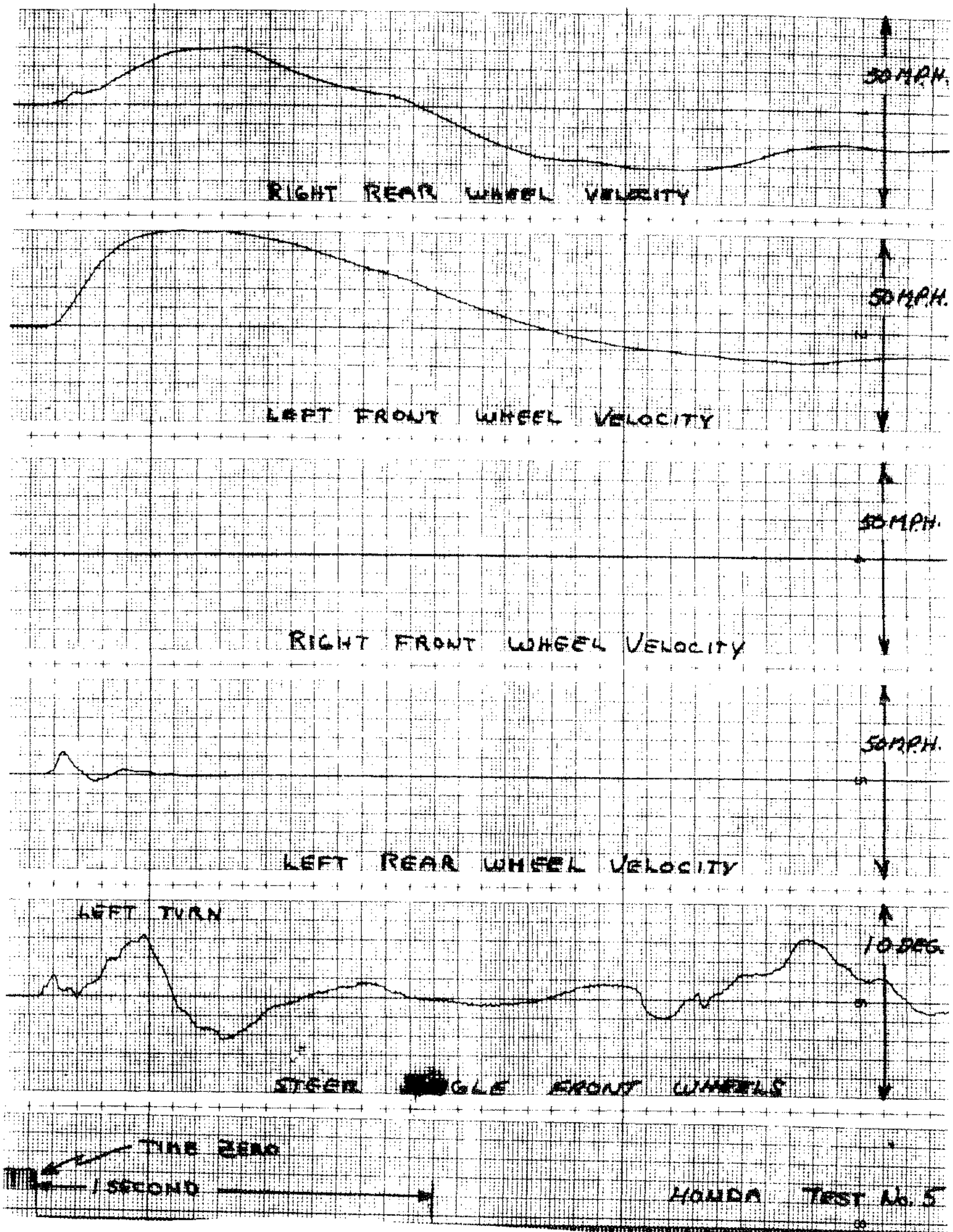


Figure 11-18 TEST NO. 5
CAR NO. 2 WHEEL RESPONSES

ZQ-6057-V-4

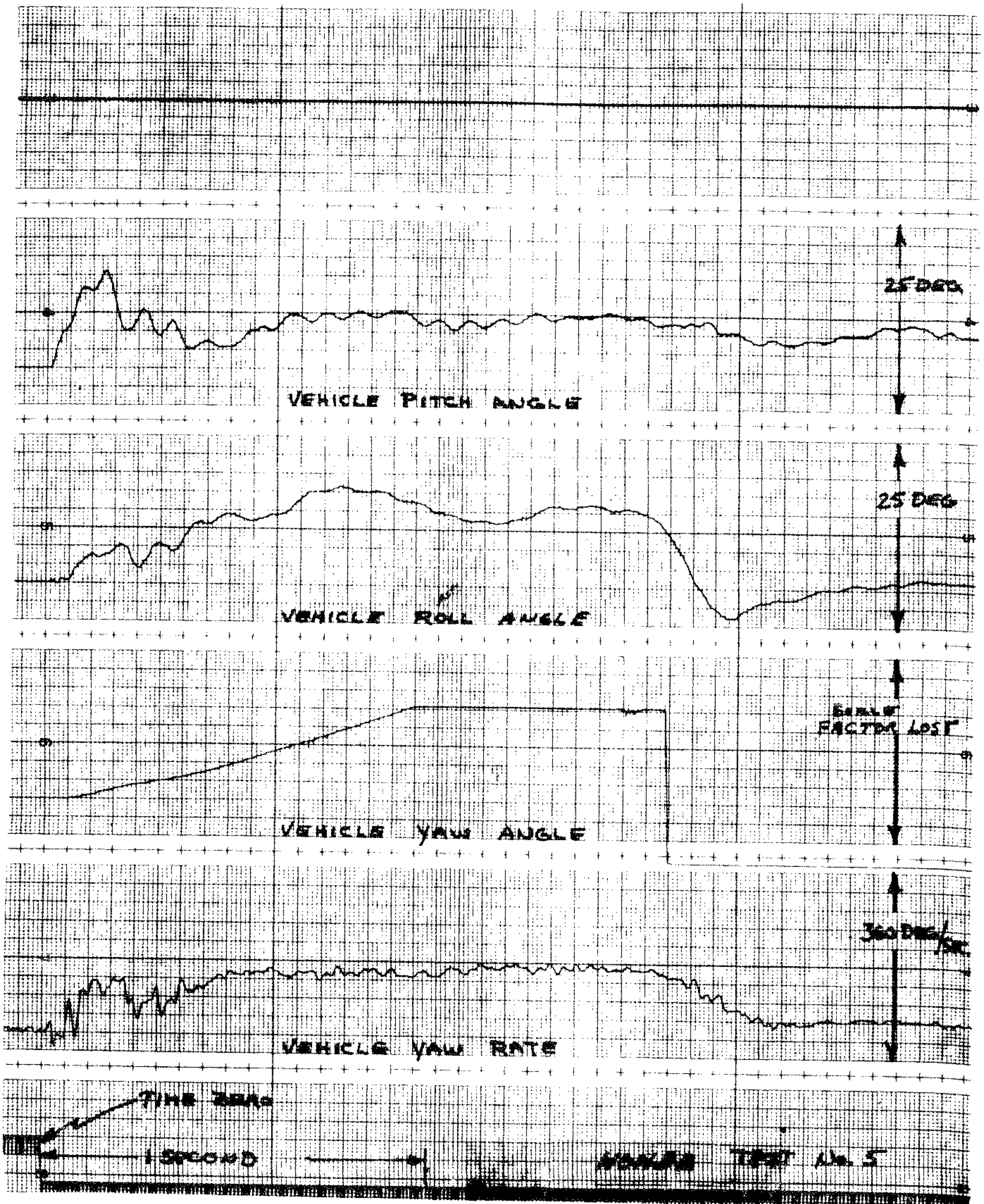


Figure 11-19 TEST NO. 5 - CAR NO. 2
VEHICLE ATTITUDE

RICSAC TEST NO. 5

VEHICLE RESPONSES

CAR NO. 1 TORINO

DATA PLOTS

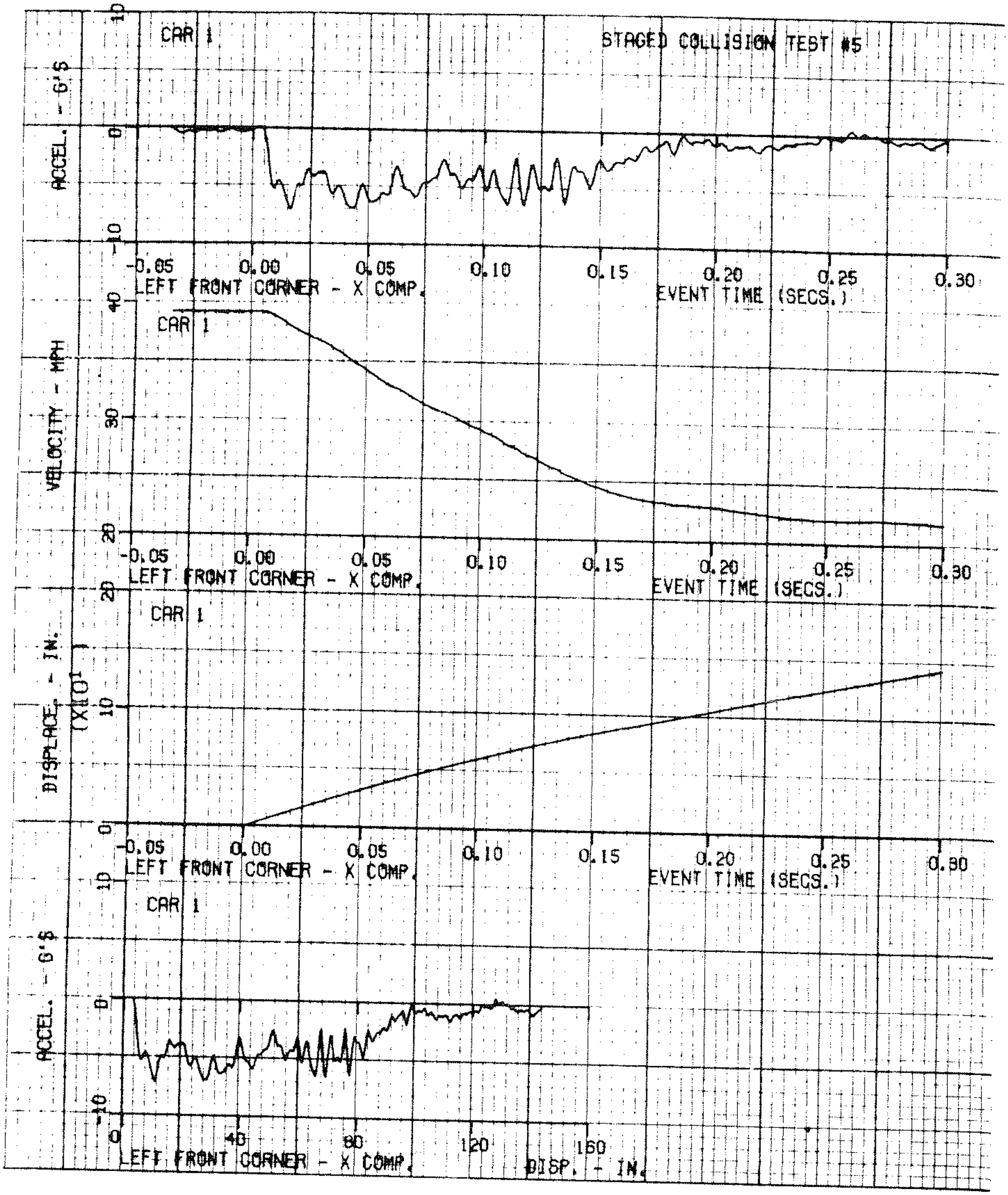
ACCELERATION TIME HISTORIES

VELOCITY TIME HISTORIES

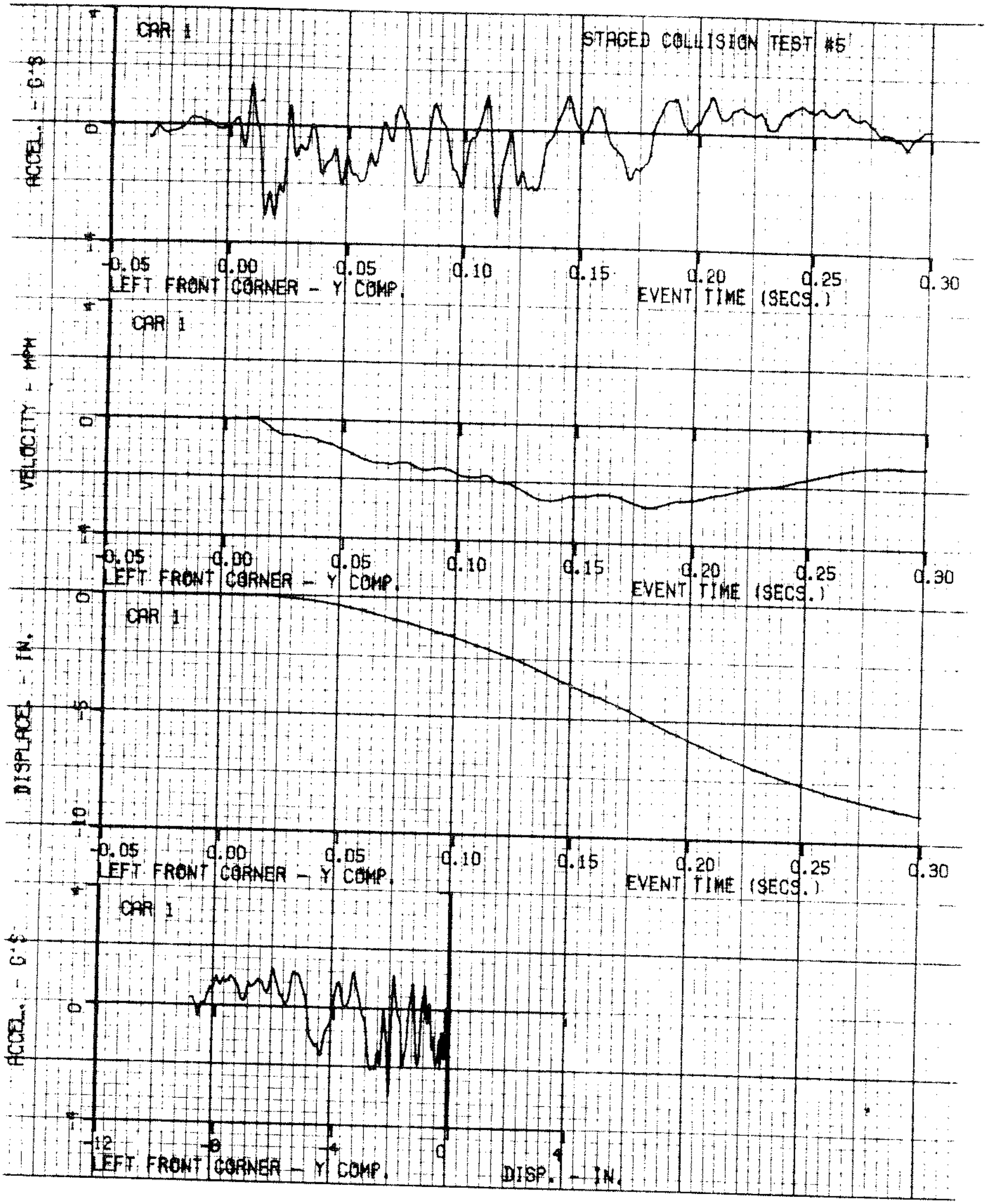
DISPLACEMENT TIME HISTORIES

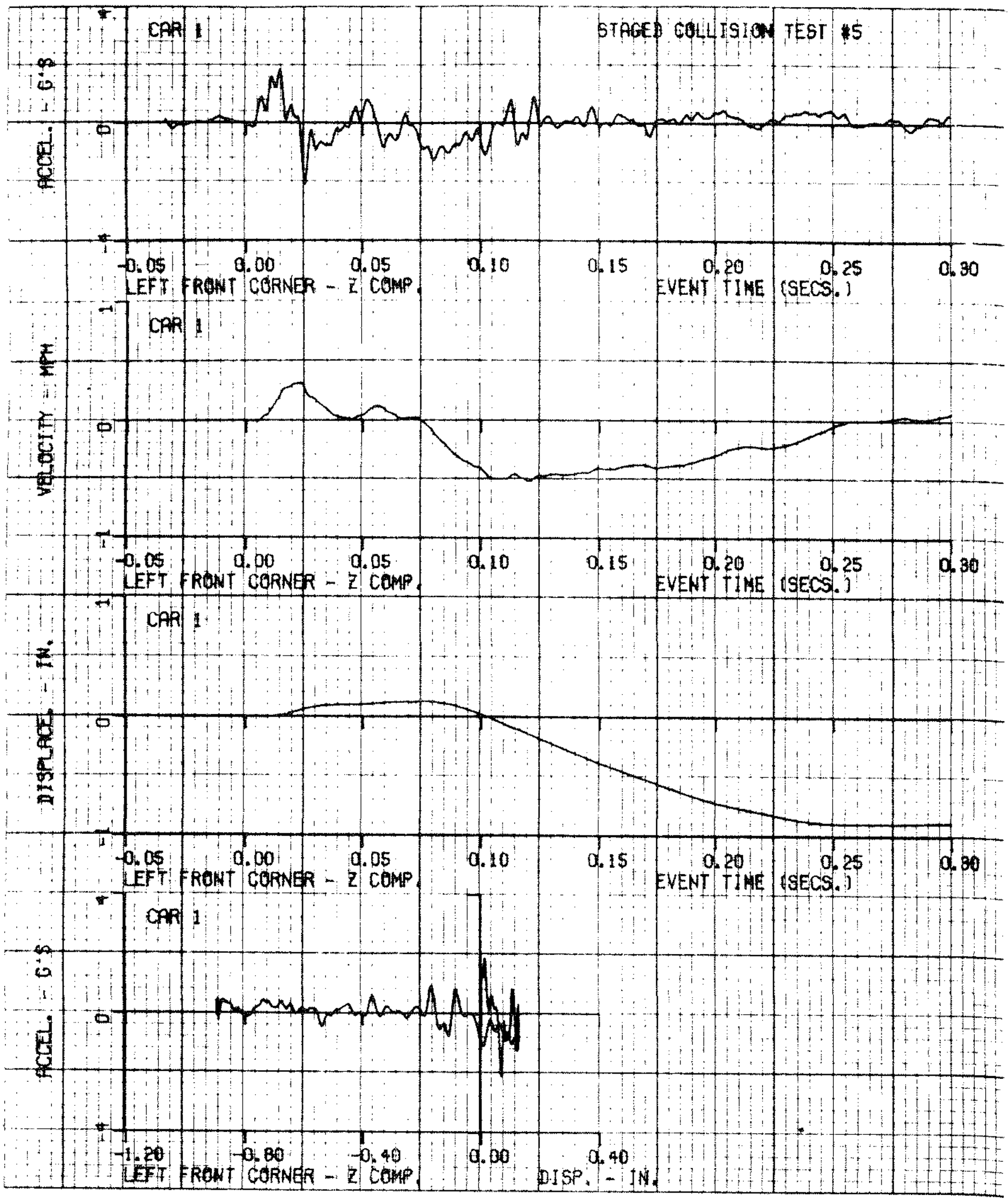
ACCELERATION VS DISPLACEMENT

FILTER CLASS 60

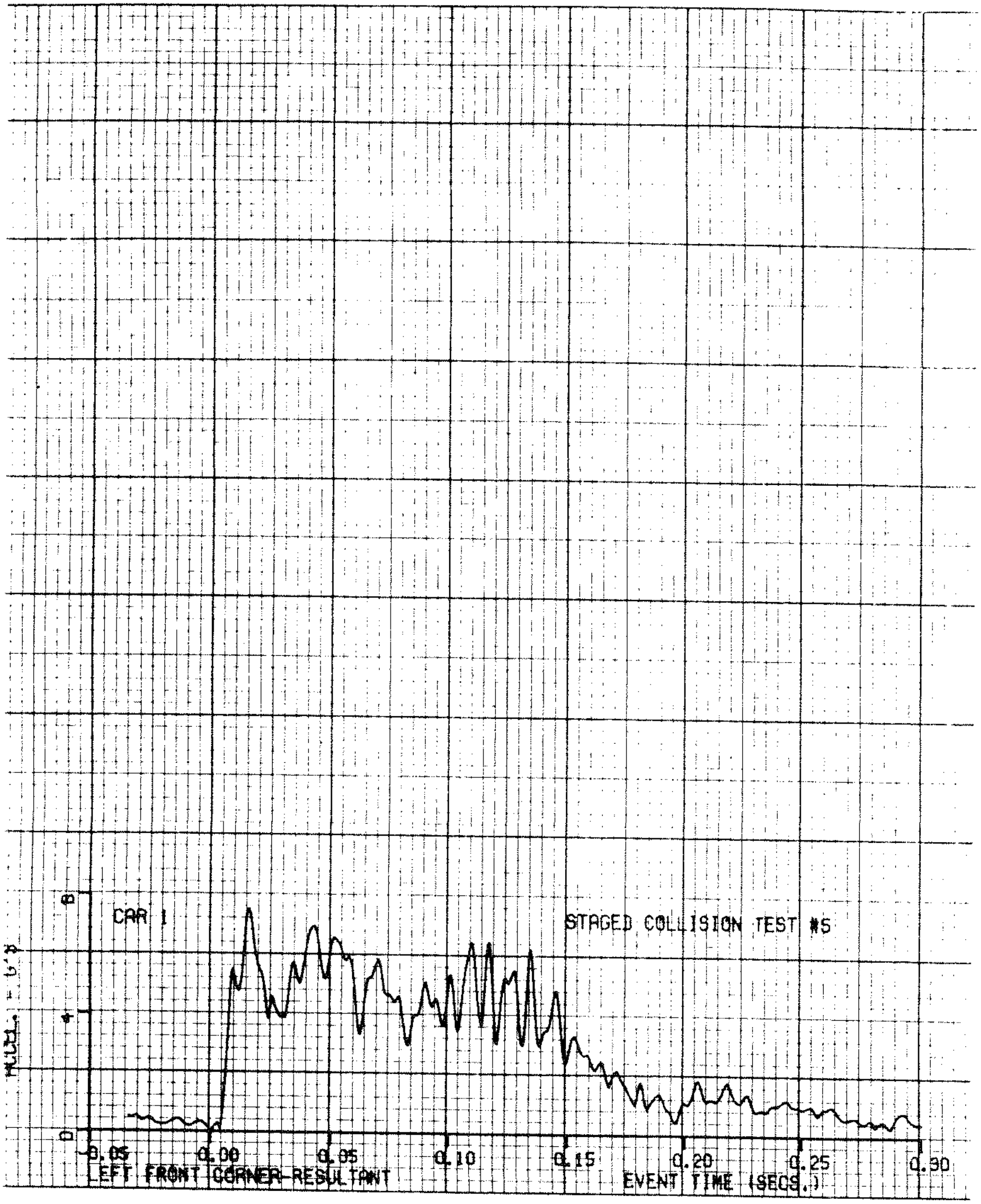

STAGED COLLISION TEST #5
CAR 1
ACCEL. - G'S
10
0
-10
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
30
20
DISPLACE. - IN.
(X10^1)
ACCEL. - G'S
0 40 80 120 160
DISP. - IN.

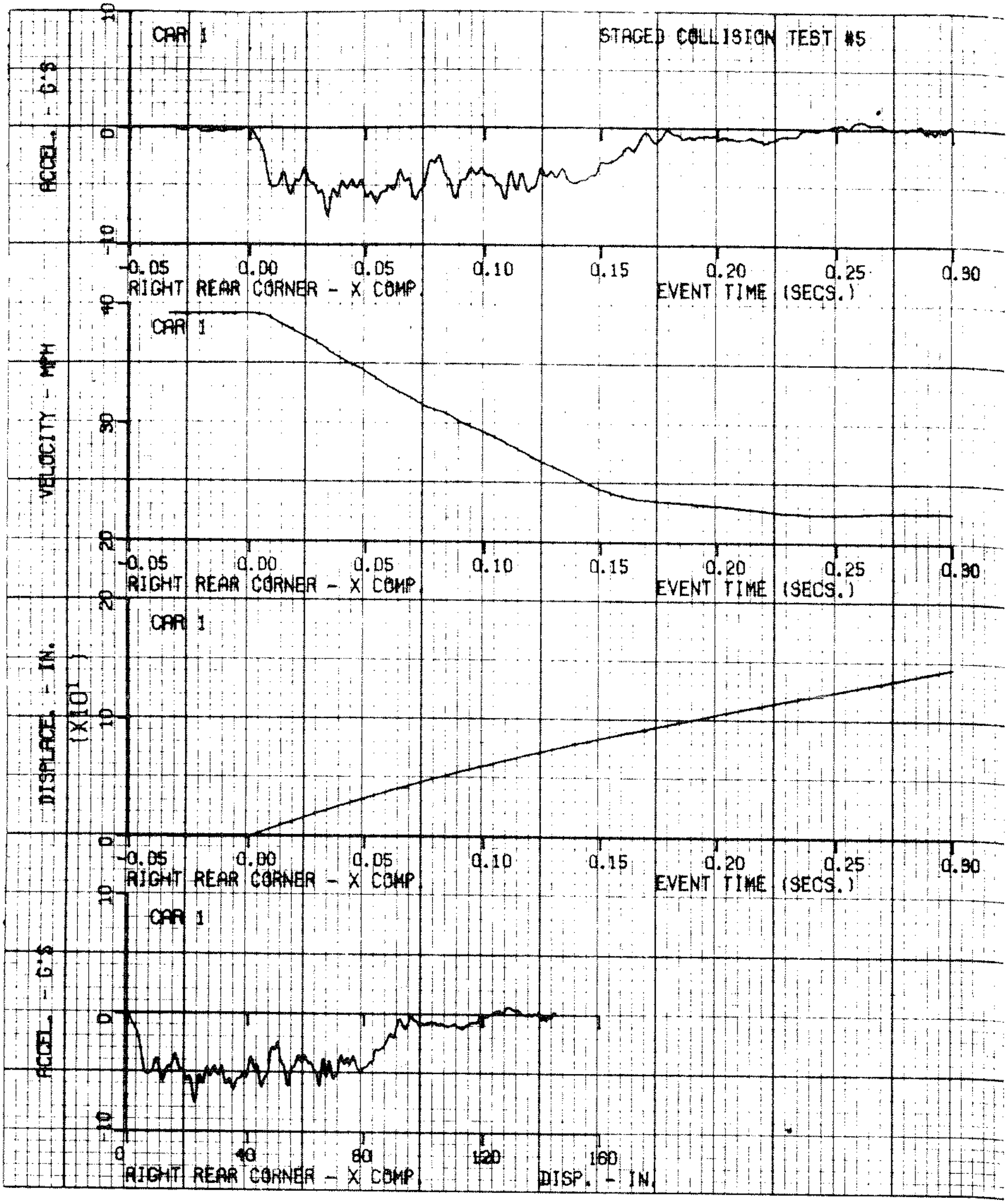
ZQ-6057-V-4


CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
0
-5
-10
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
-12 -8 -4 0 4
LEFT FRONT CORNER - Y COMP.
DISP. - IN.

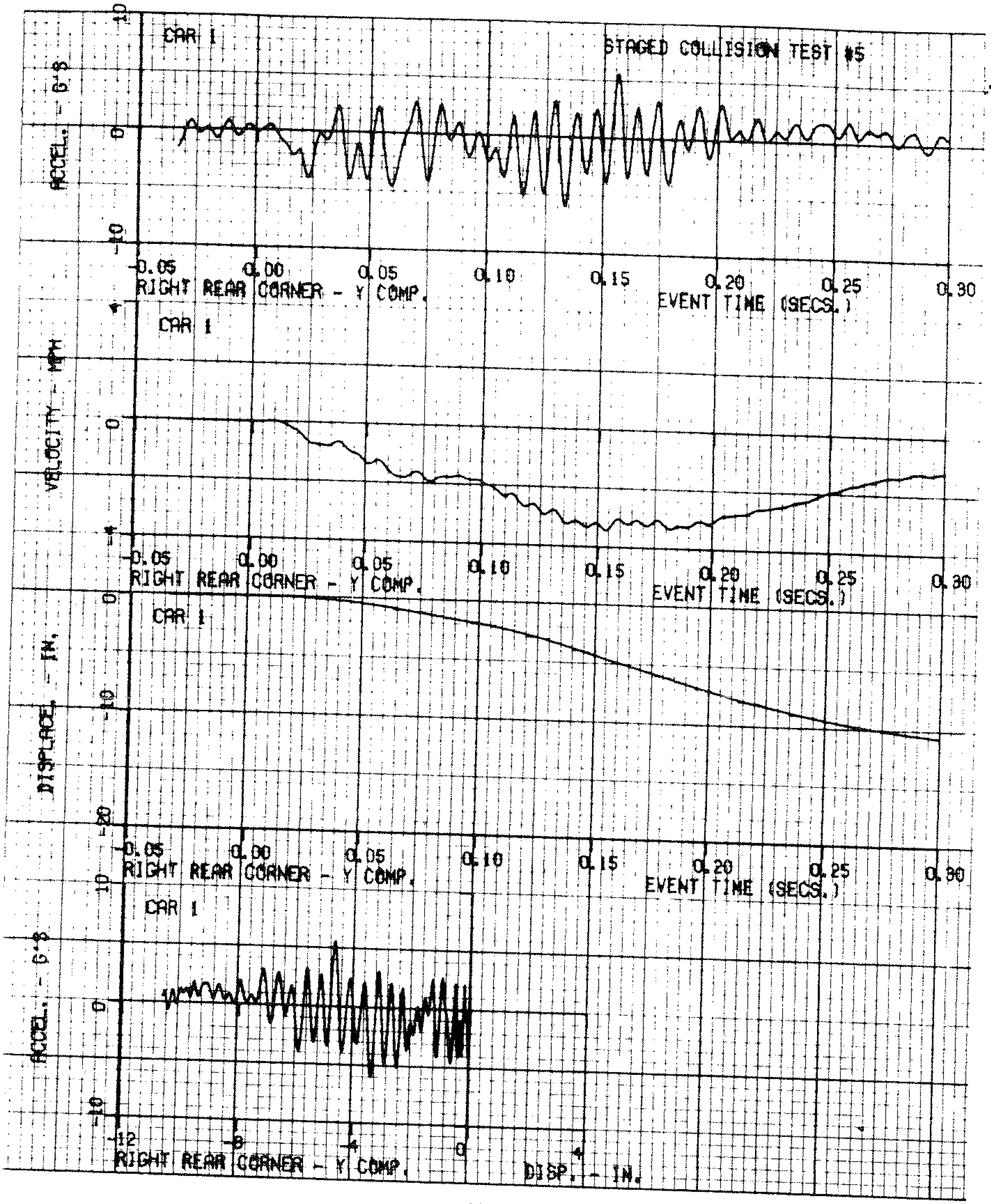

CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
-1.20 -0.80 -0.40 0.00 0.40
LEFT FRONT CORNER - Z COMP.
DISP. - IN.

ZQ-6057-V-4

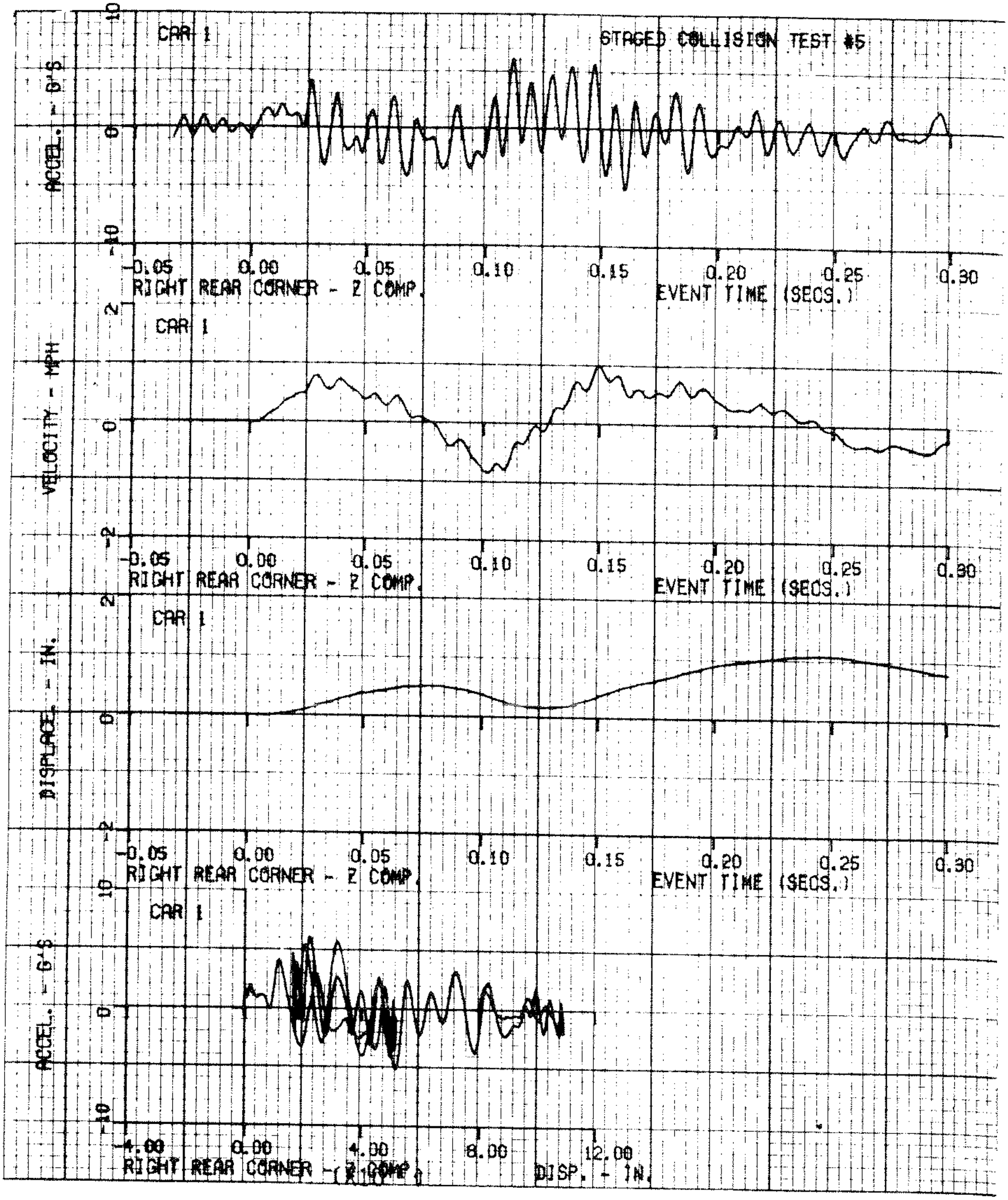

CAR 1
STAGED COLLISION TEST #5
8
4
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

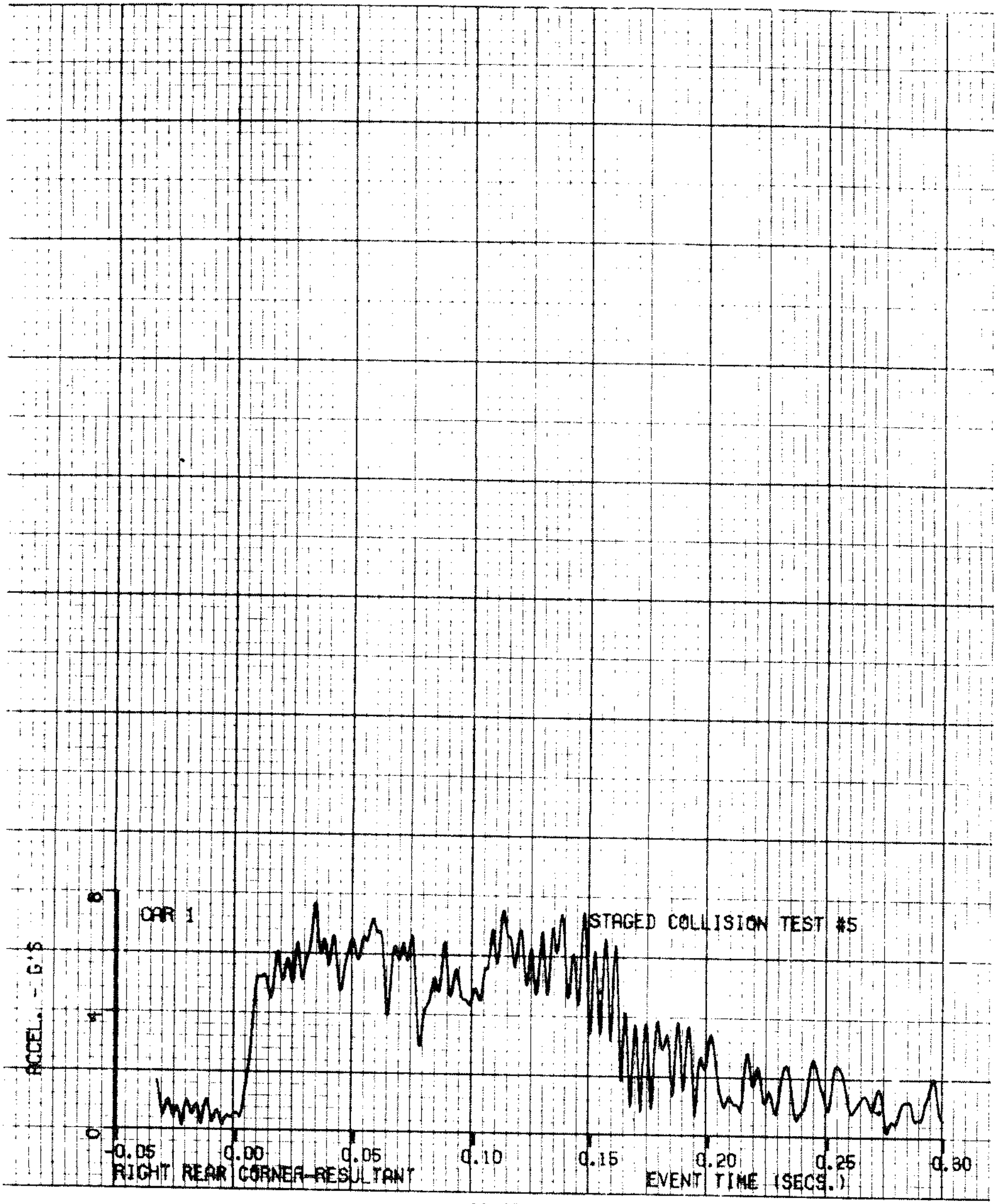

CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
30
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
(X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
40
80
120
160
RIGHT REAR CORNER - X COMP.
DISP. - IN.

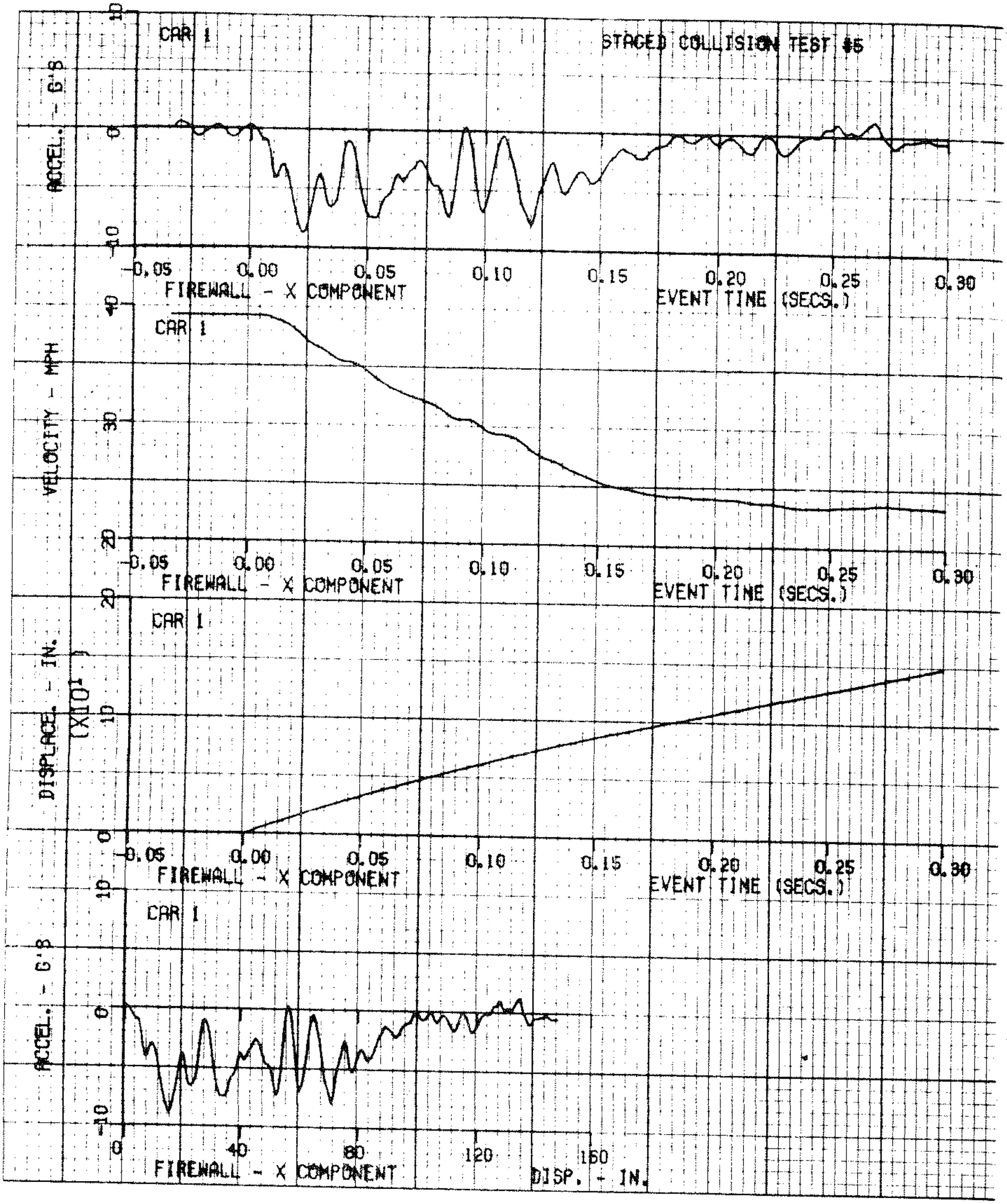
ZQ-6057-V-4

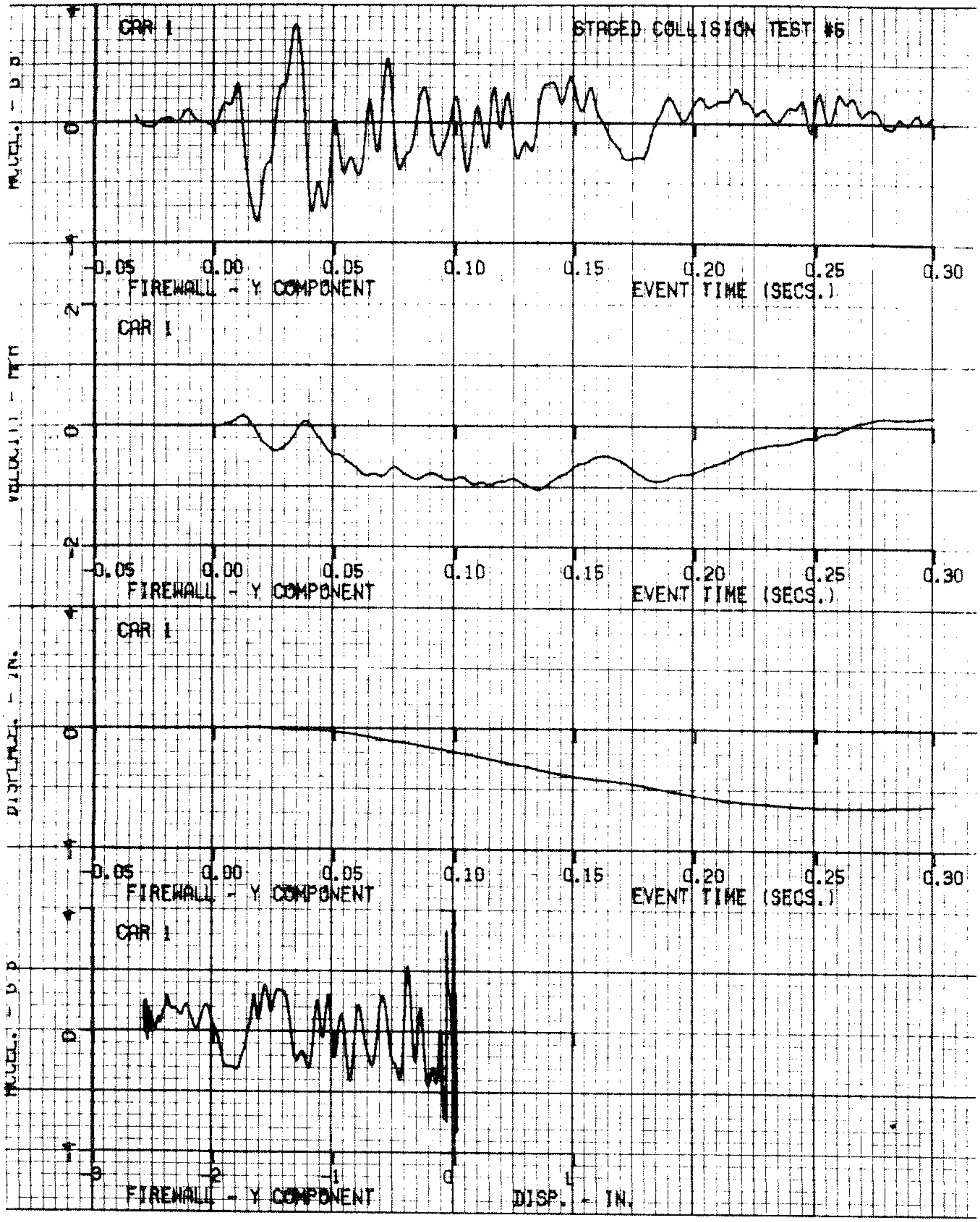


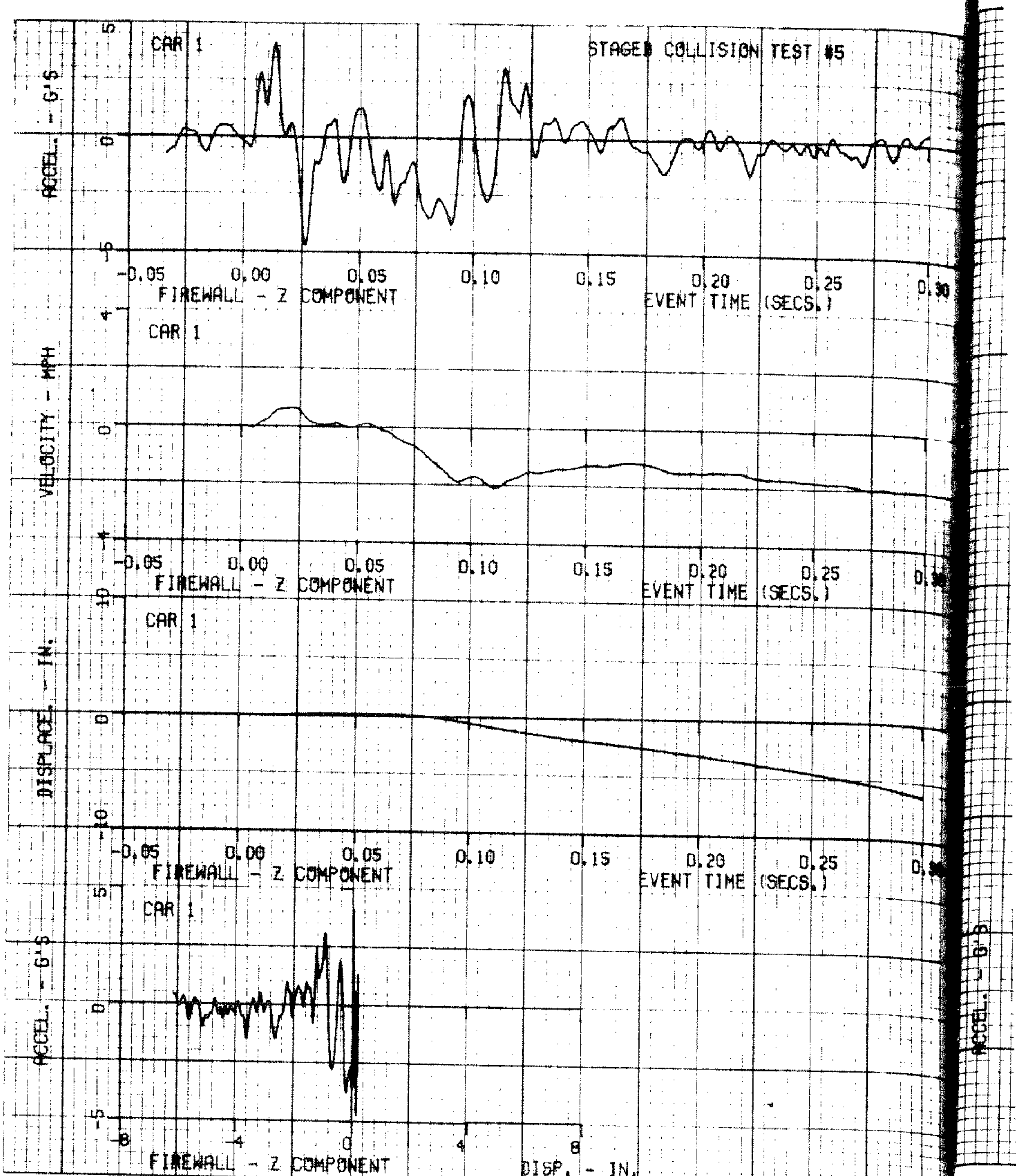
CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
DISPLACE. - IN.
0
CAR 1
-10
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
ACCEL. - G'S
10
CAR 1
0
-10
-12
-8
-4
0
4
RIGHT REAR CORNER - Y COMP.
DISP. - IN.

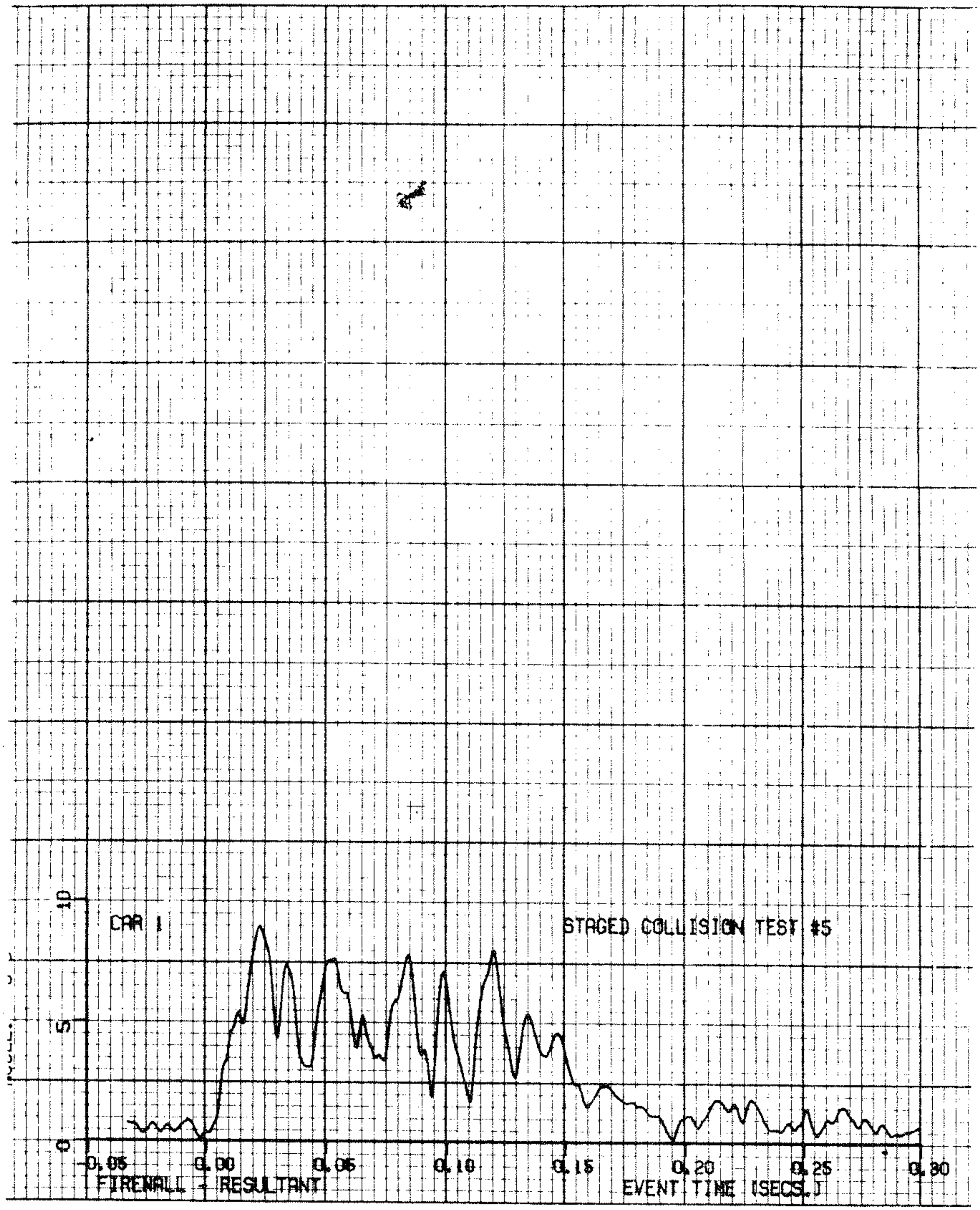

CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
2
0
-2
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
-4.00
0.00
4.00
8.00
12.00
RIGHT REAR CORNER - Z COMP.
DISP. - IN.

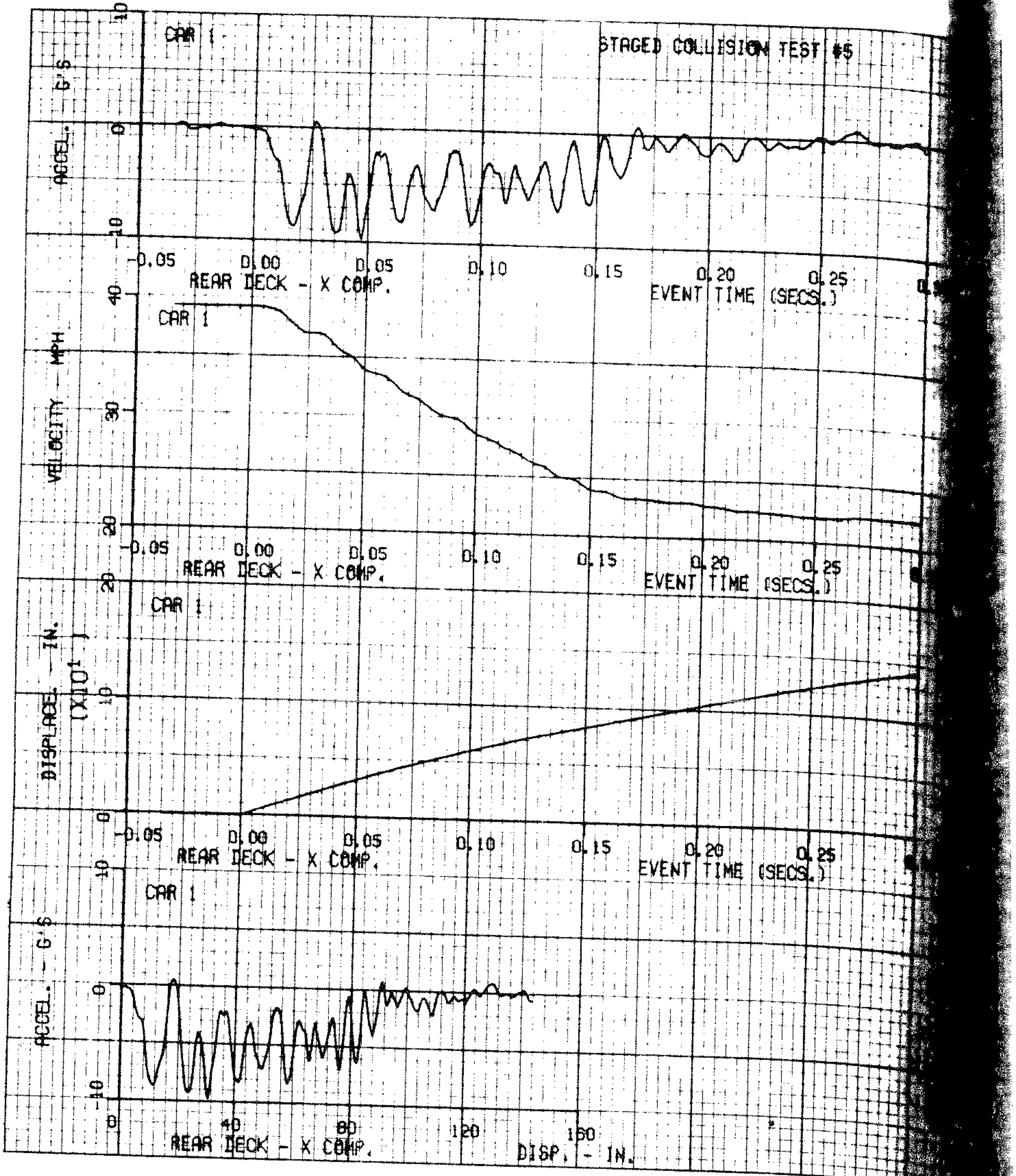

CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
8
4
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
RIGHT REAR CORNER-RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
40
30
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
(X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
10
0
-10
0
40
80
120
160
FIREWALL - X COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #5
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 1
-3 -2 -1 0 1
FIREWALL - Y COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Z COMPONENT
EVENT TIME (SECS.)
CAR 1
ACCEL. - G'S
5
0
-5
-8
-4
0
4
8
FIREWALL - Z COMPONENT
DISP. - IN.


CAR 1
STAGED COLLISION TEST #5
10
5
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)


CAR 1
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
REAR DECK - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
30
20
DISPLACE. - IN.
(X10¹)
10
40
80
120
160
DISP. - IN.

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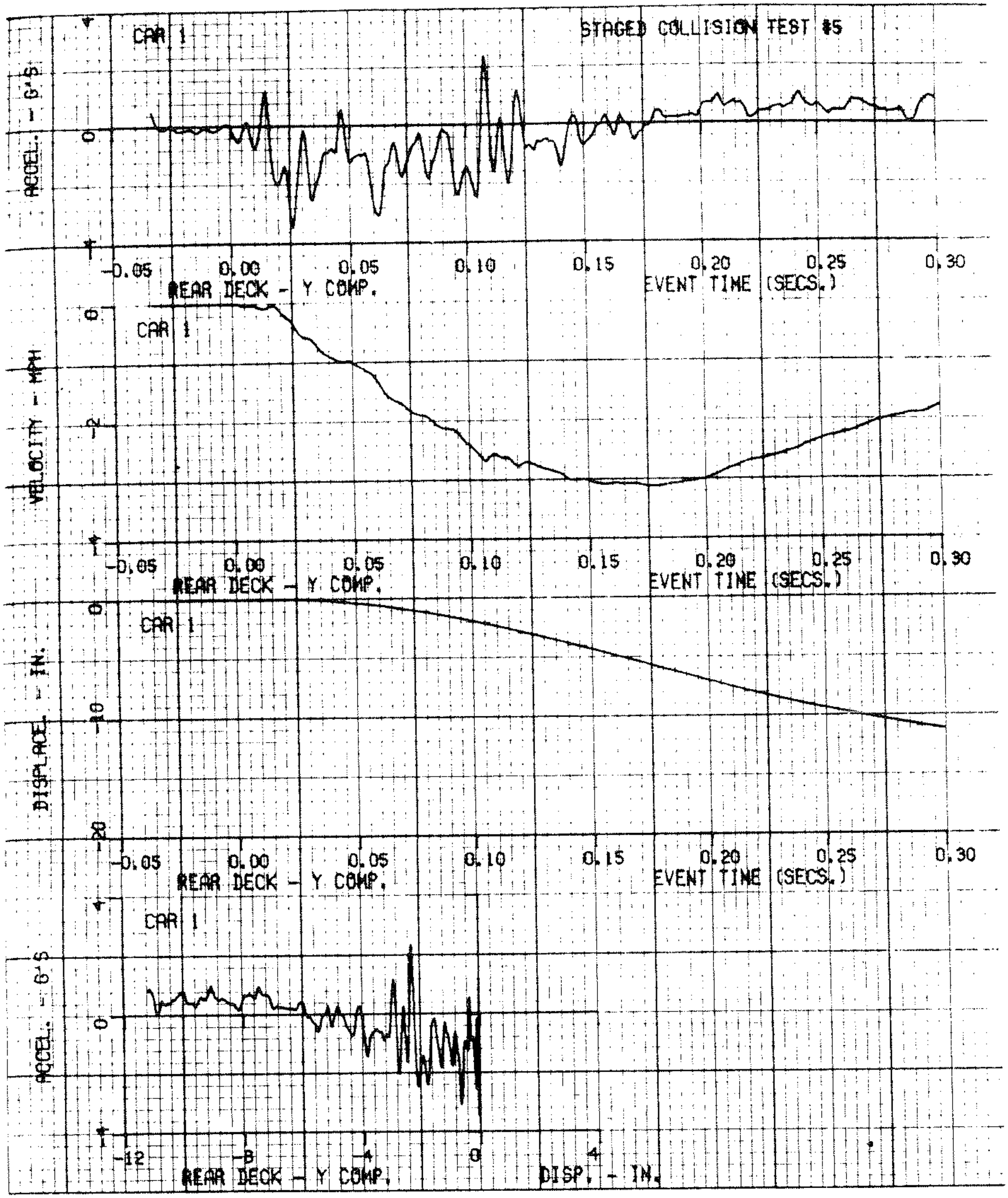
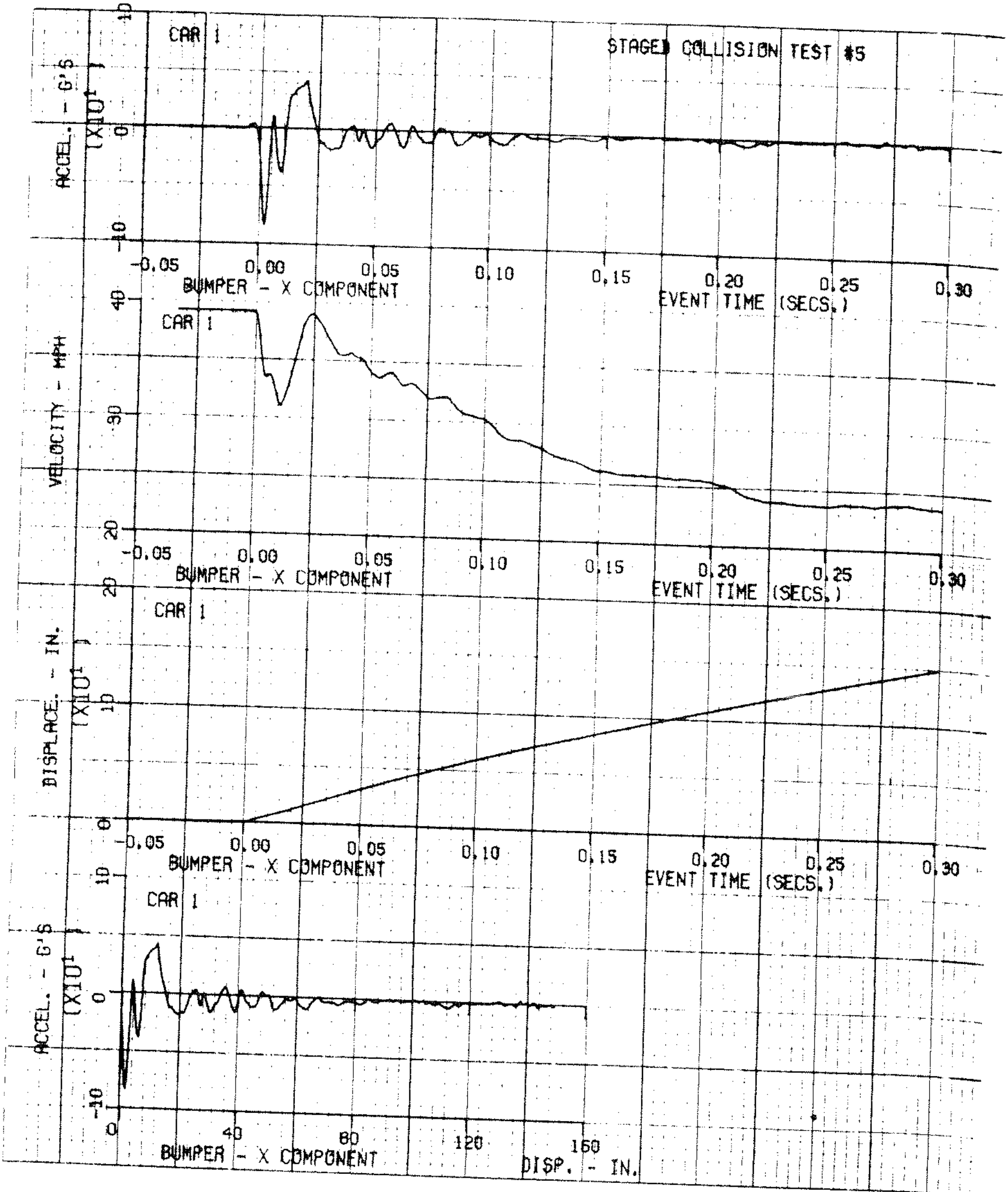

STAGED COLLISION TEST #5
CAR 1
ACCEL. - G'S
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
EVENT TIME (SECS.)
REAR DECK - Y COMP.
CAR 1
VELOCITY - MPH
0
-2
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
EVENT TIME (SECS.)
REAR DECK - Y COMP.
CAR 1
DISPLACE. - IN.
0
-10
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
EVENT TIME (SECS.)
REAR DECK - Y COMP.
CAR 1
ACCEL. - G'S
0
-12 -8 -4 0 4
REAR DECK - Y COMP.
DISP. - IN.


STAGED COLLISION TEST #5
CAR 1
ACCEL. - G'S (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
BUMPER - X COMPONENT
EVENT TIME (SECS.)
VELOCITY - MPH
40
30
20
DISPLACE. - IN. (X10¹)
20
10
0
0
40
80
120
160
DISP. - IN.

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RICSAC TEST NO. 5

VEHICLE RESPONSES

VEHICLE NO. 2 HONDA

DATA PLOTS

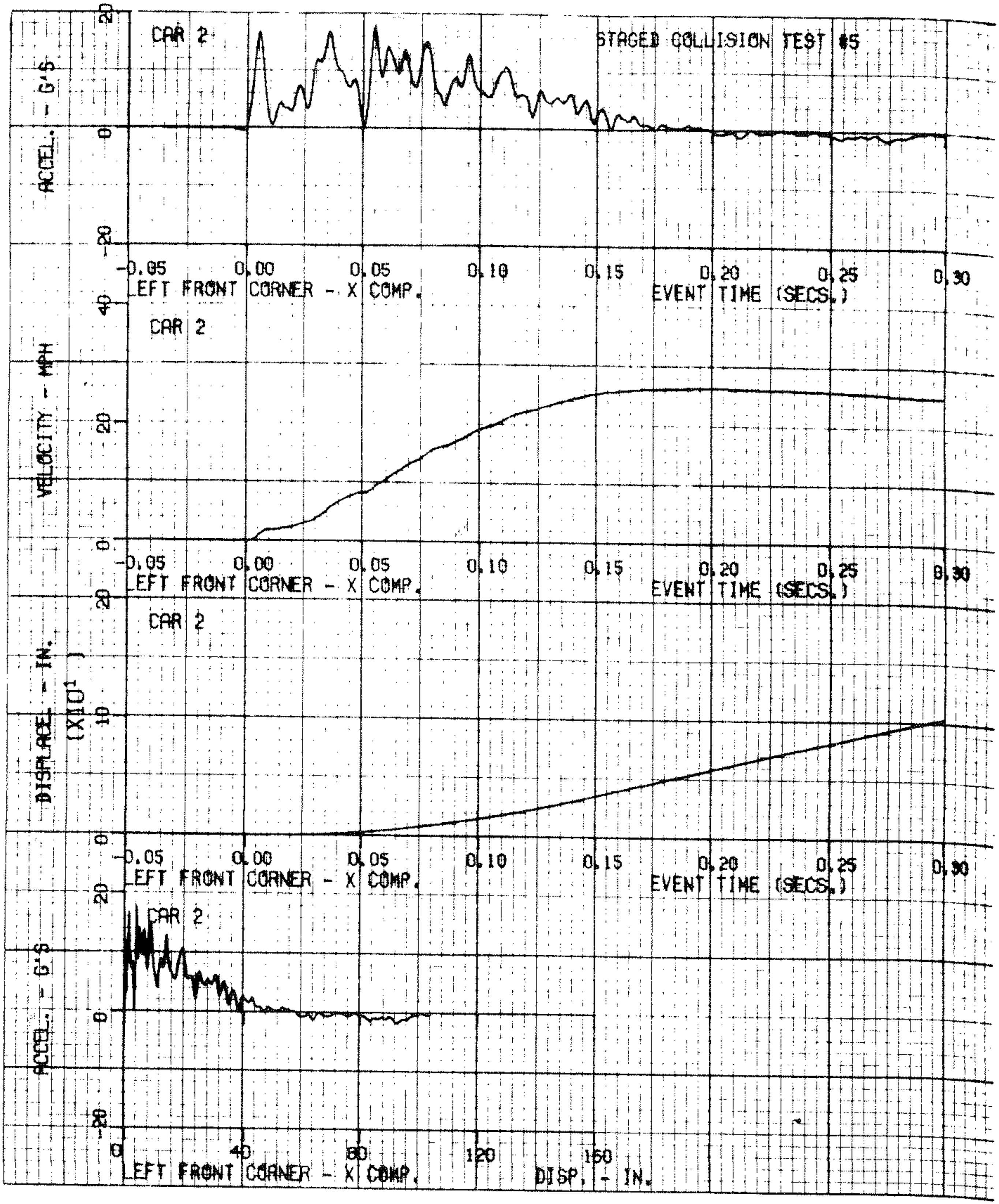
ACCELERATION TIME HISTORIES

VELOCITY TIME HISTORIES

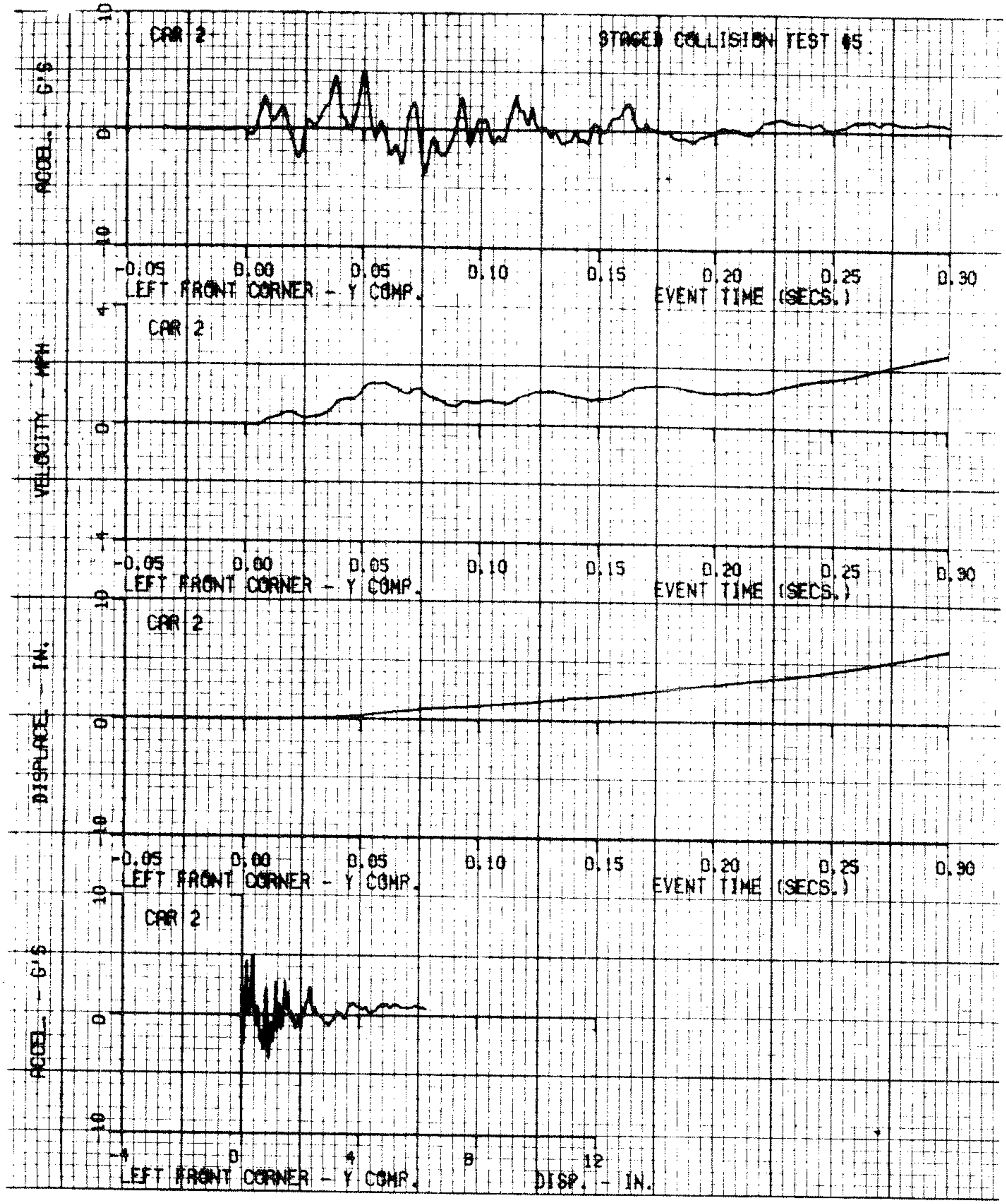
DISPLACEMENT TIME HISTORIES

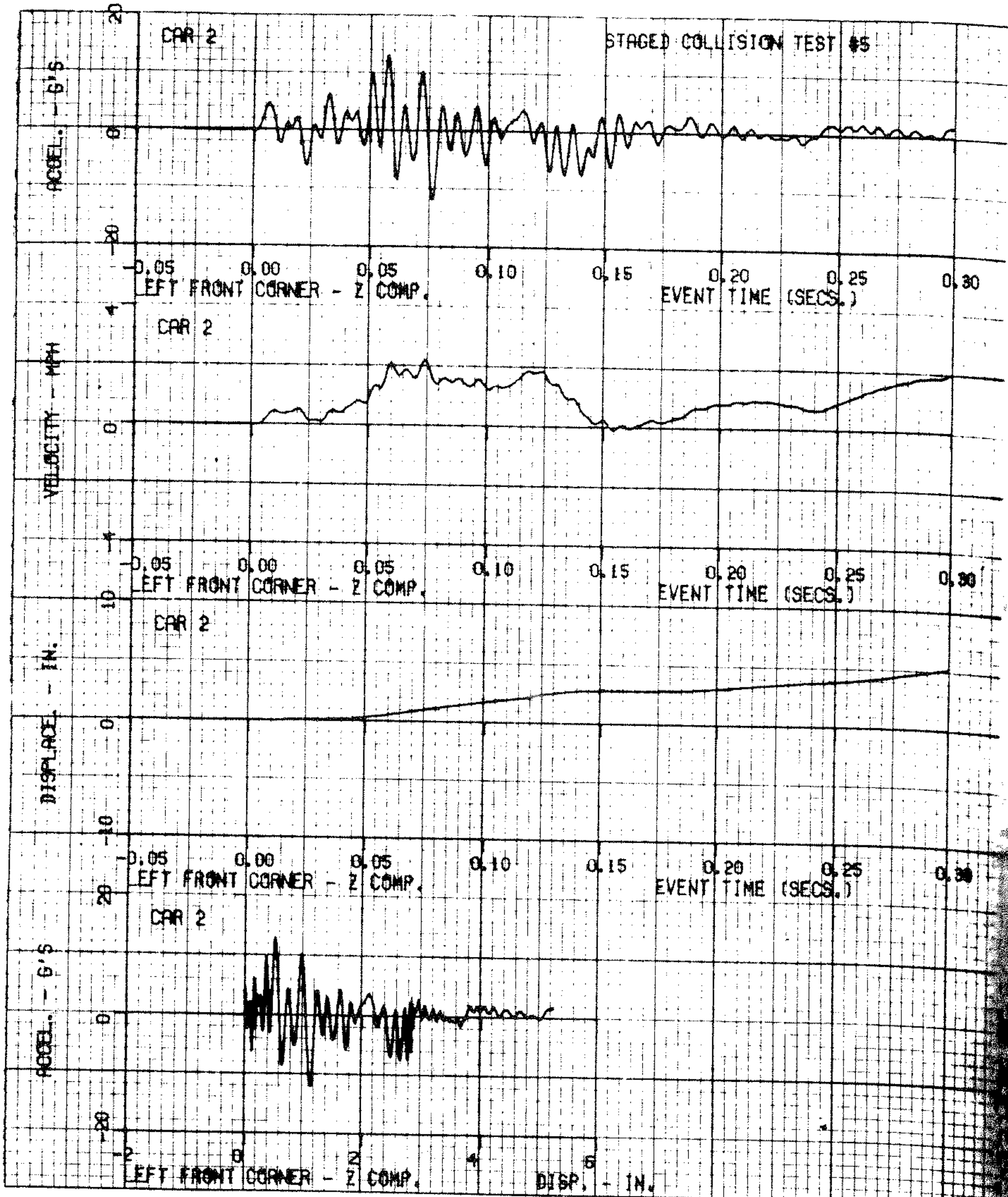
ACCELERATION VS DISPLACEMENT

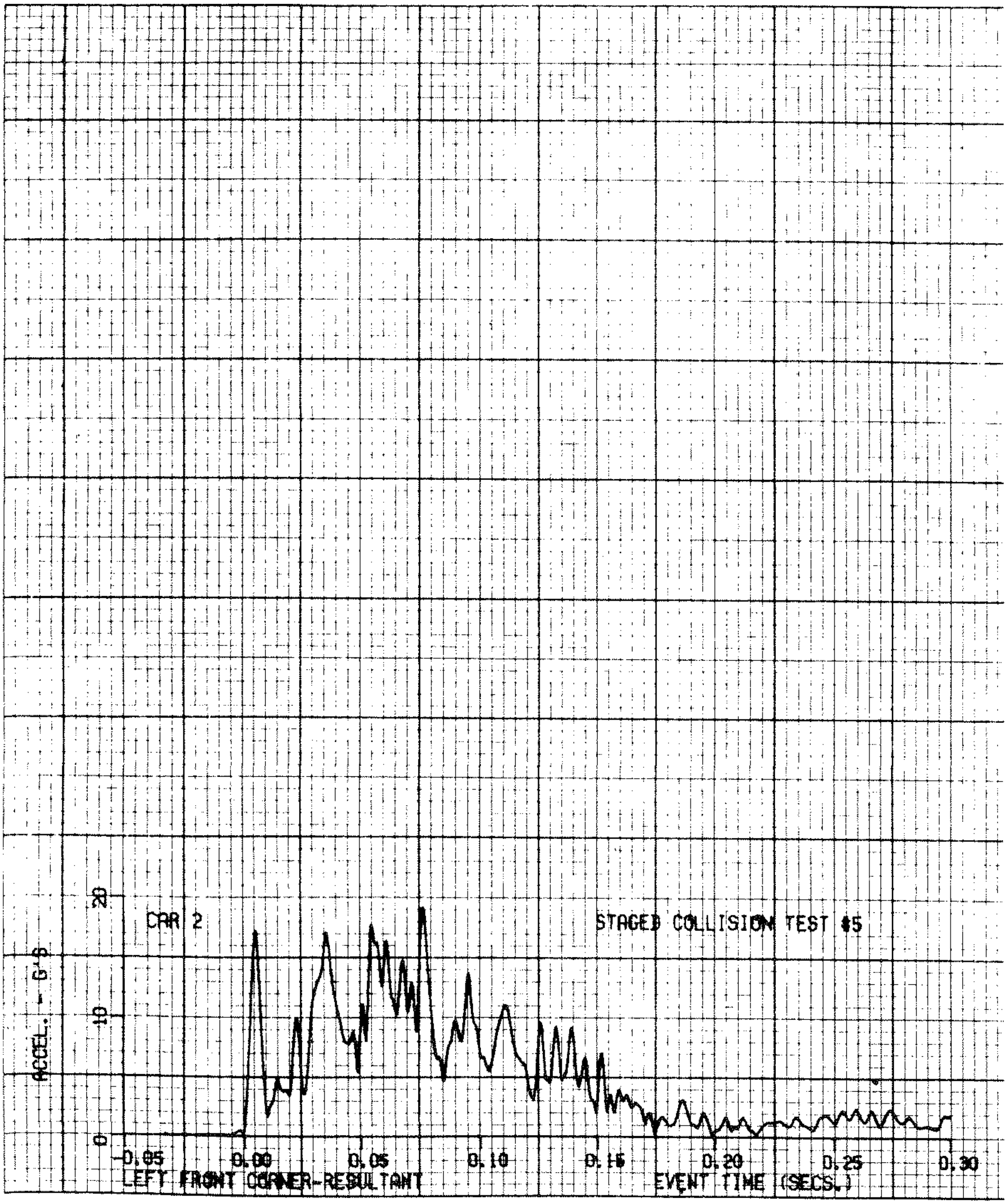
FILTER CLASS 60


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
20
0
DISPLACE. - IN.
(X10¹)
10
LEFT FRONT CORNER - X COMP.
0
40
80
120
160
DISP. - IN.

ZQ-6057-V-4


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
10
0
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
0
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
10
0
10
-4
0
4
8
12
LEFT FRONT CORNER - Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
4
0
-4
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-2
0
2
4
6
LEFT FRONT CORNER - Z COMP.
DISP. - IN.



CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT FRONT CORNER-RESULTANT
EVENT TIME (SECS.)

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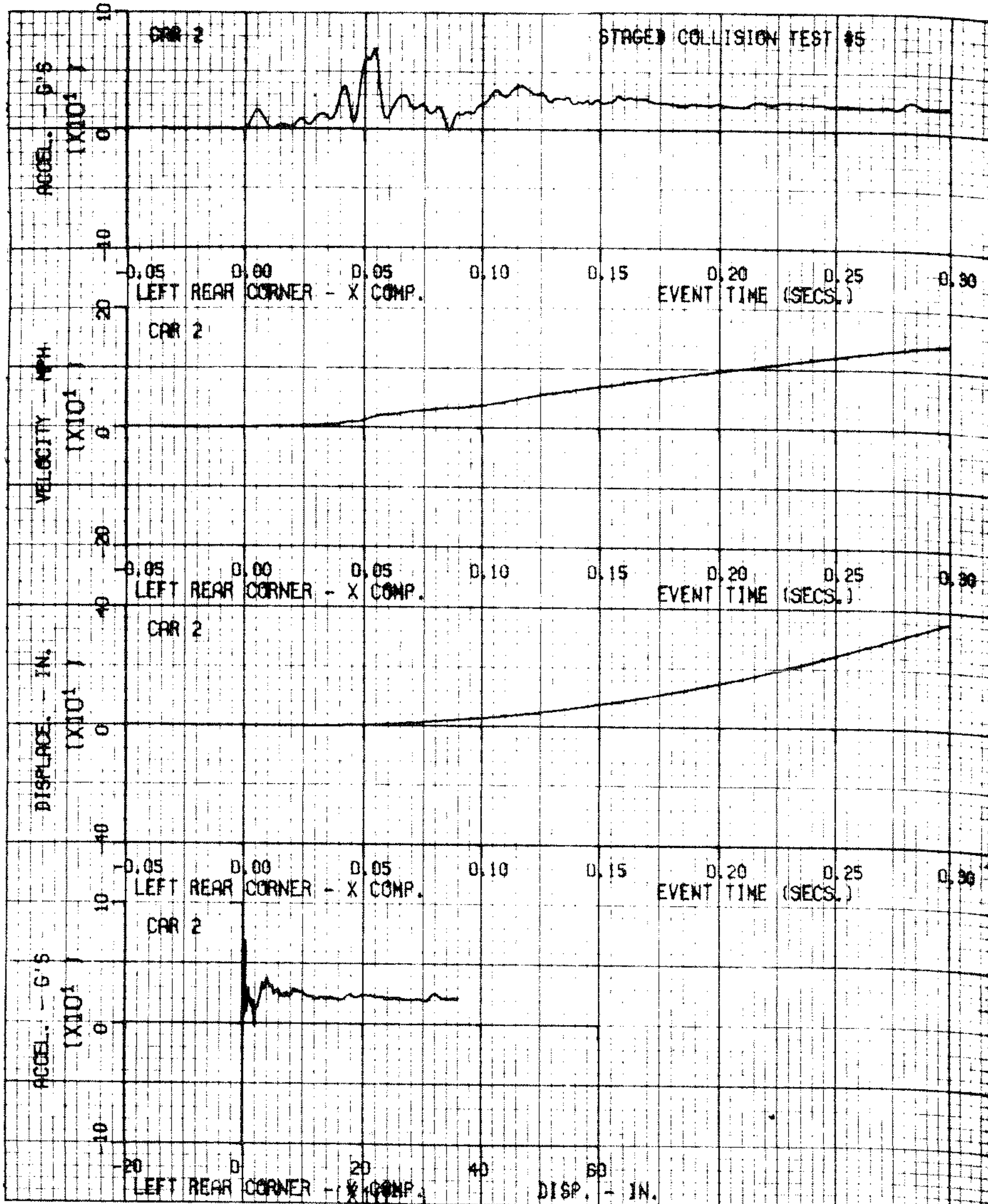
CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH (X10¹)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. (X10¹)
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
10
0
-10
-20
0
20
40
60
LEFT REAR CORNER - X COMP.
DISP. - IN.

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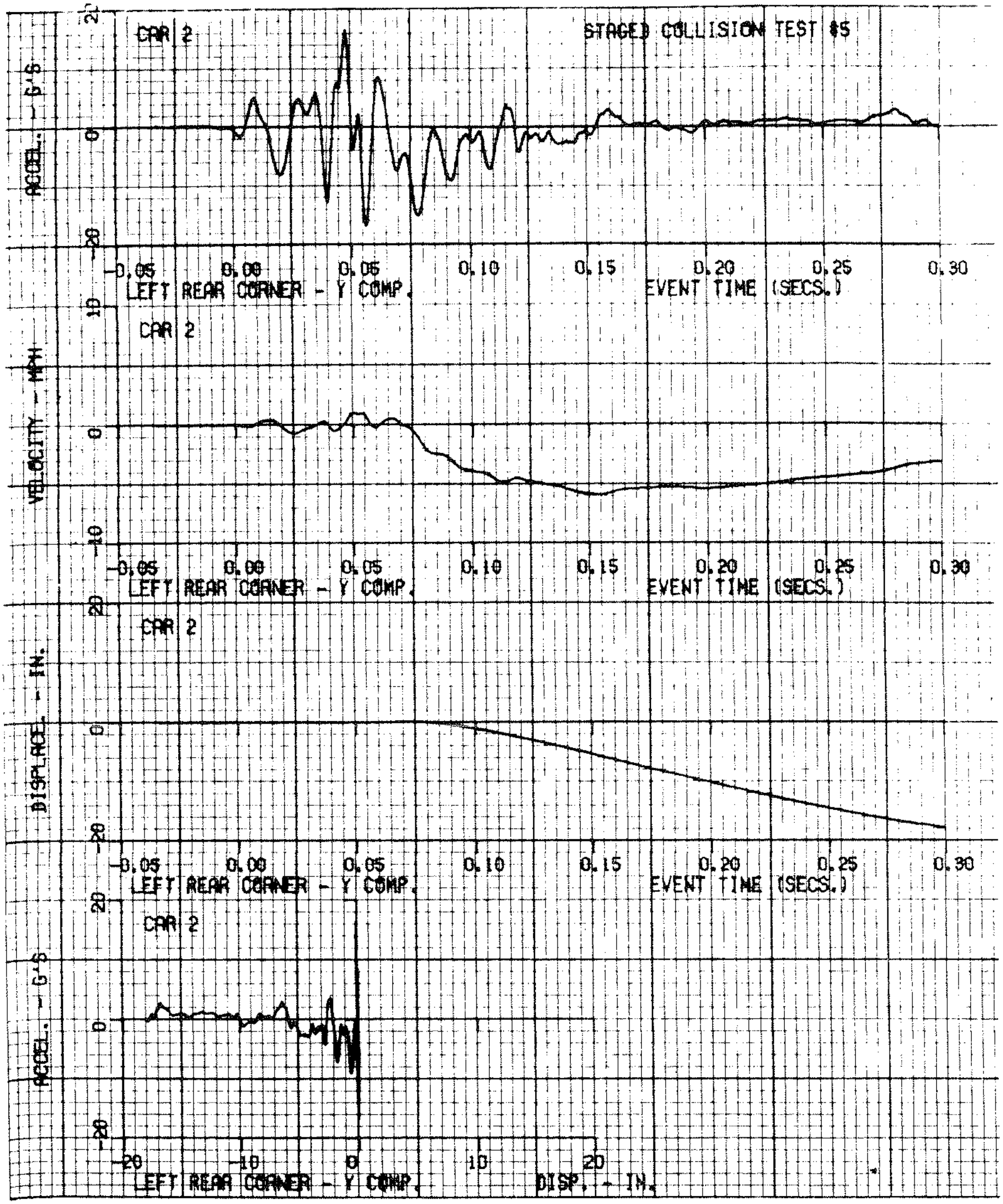
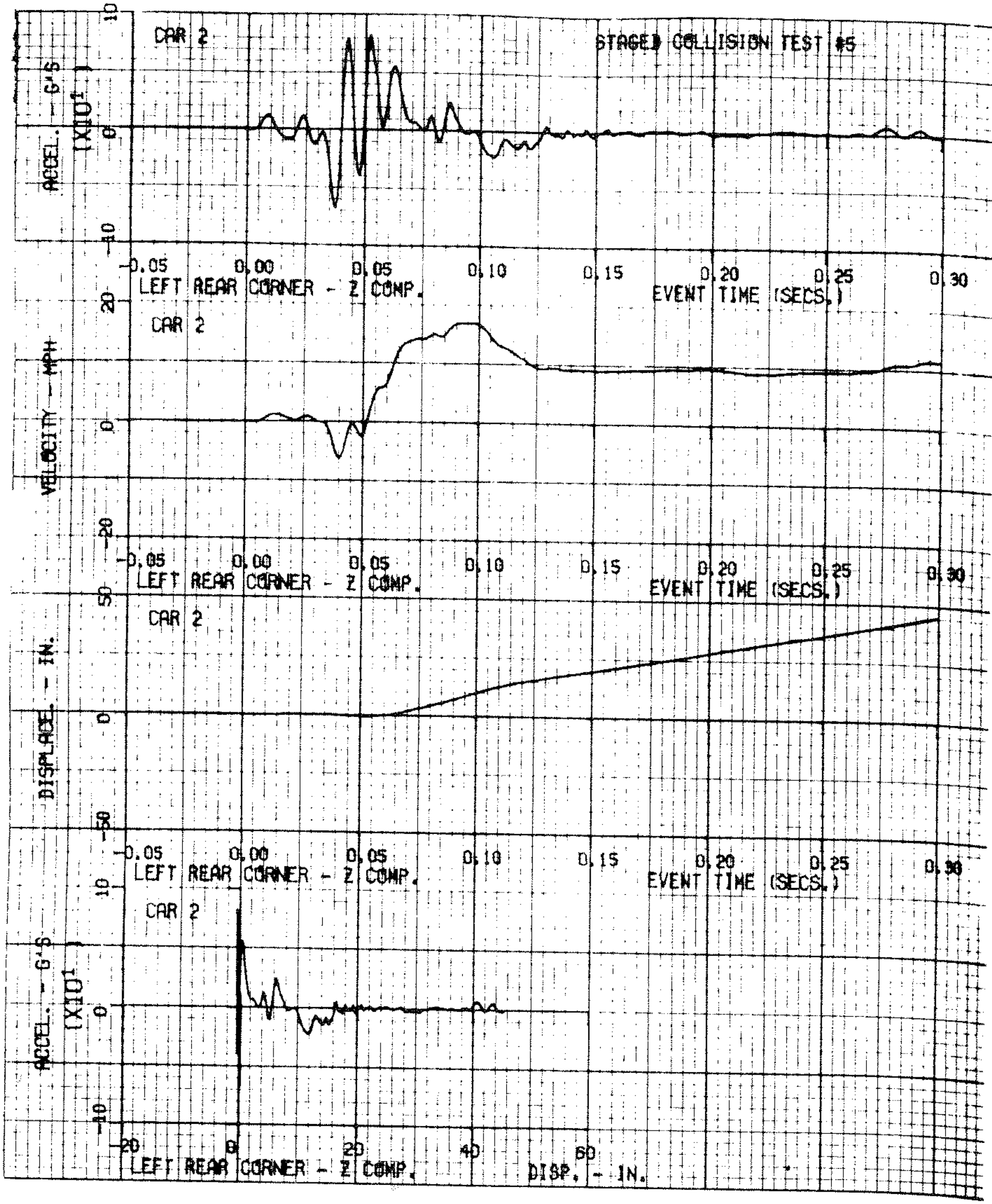
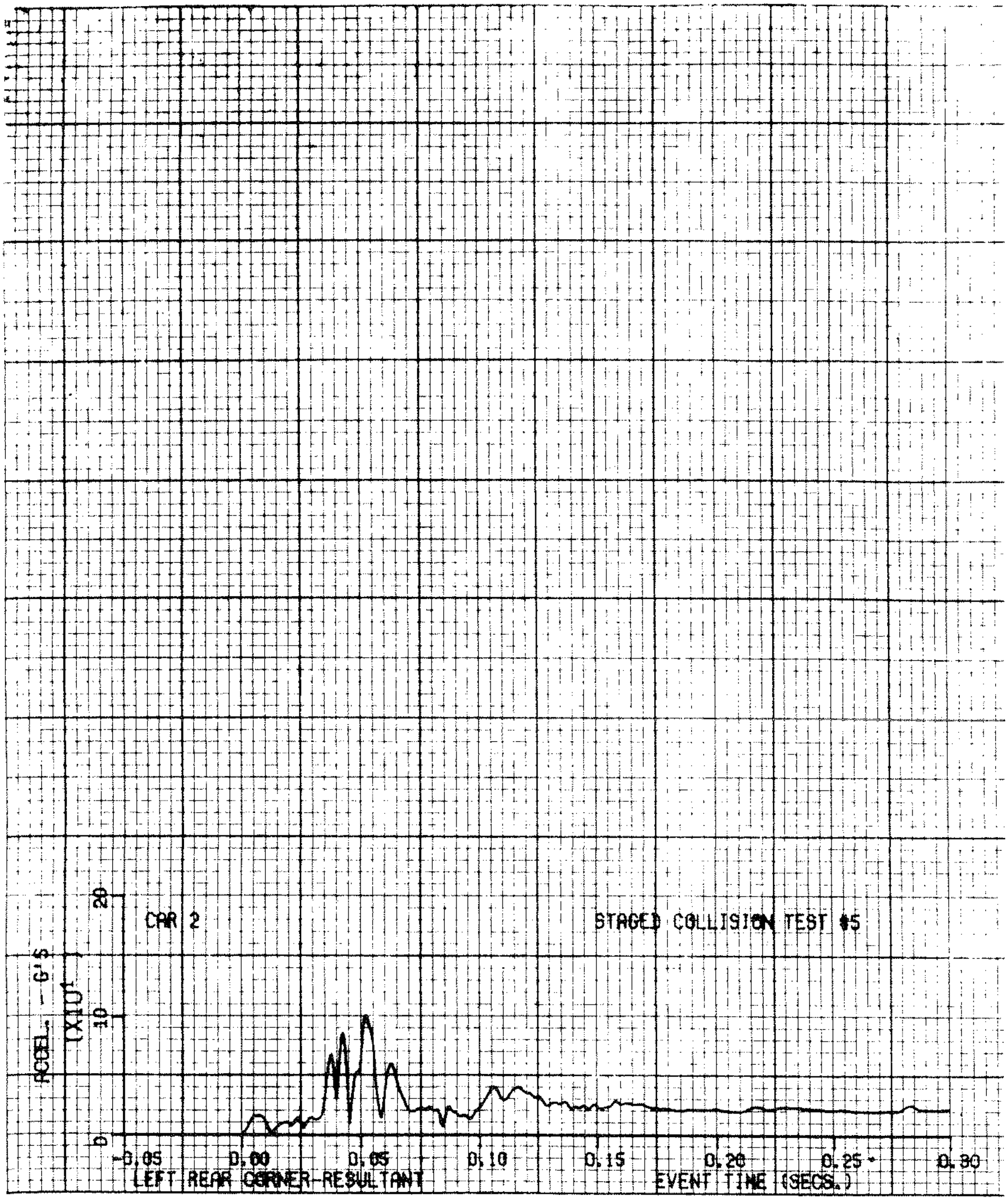
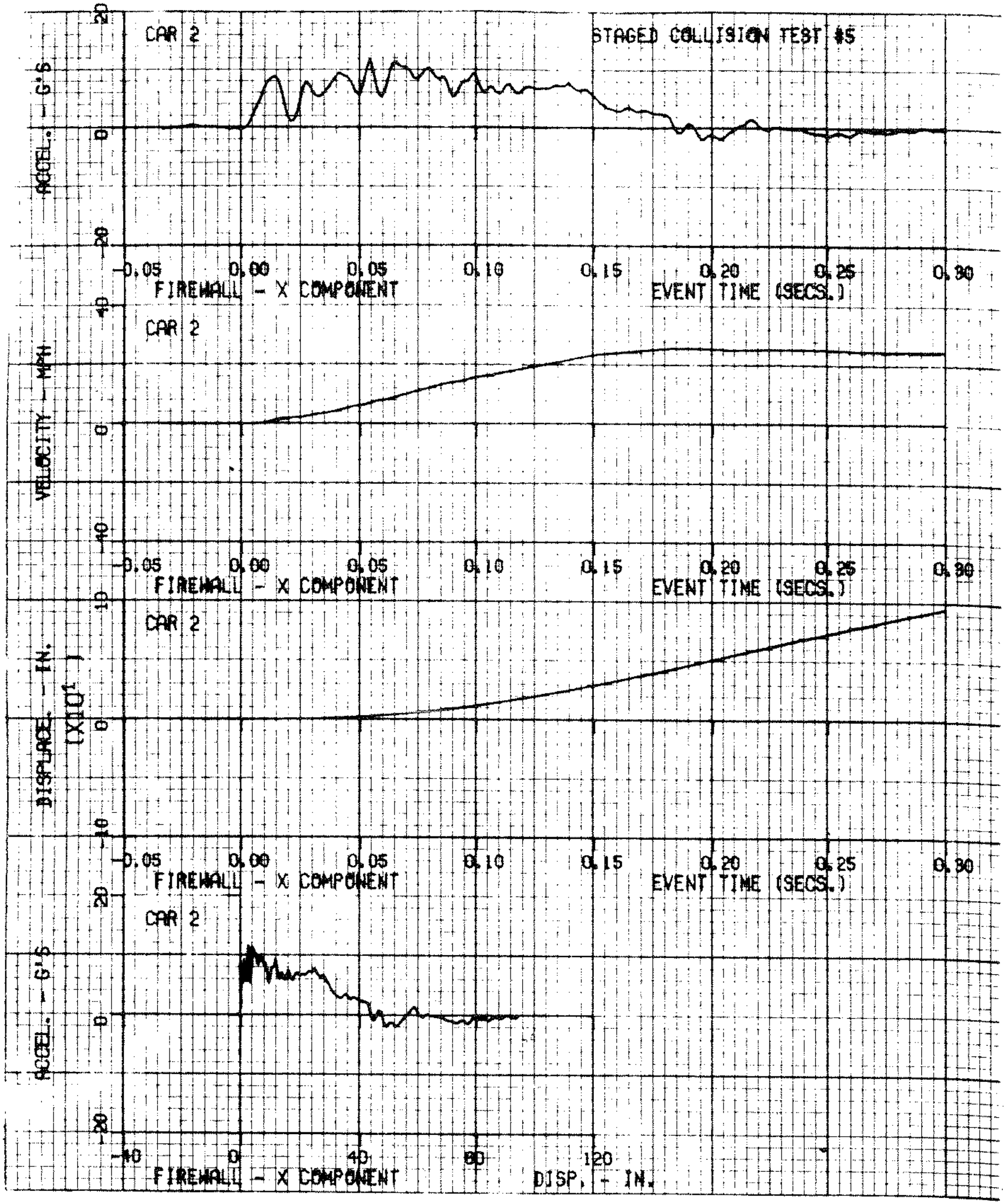
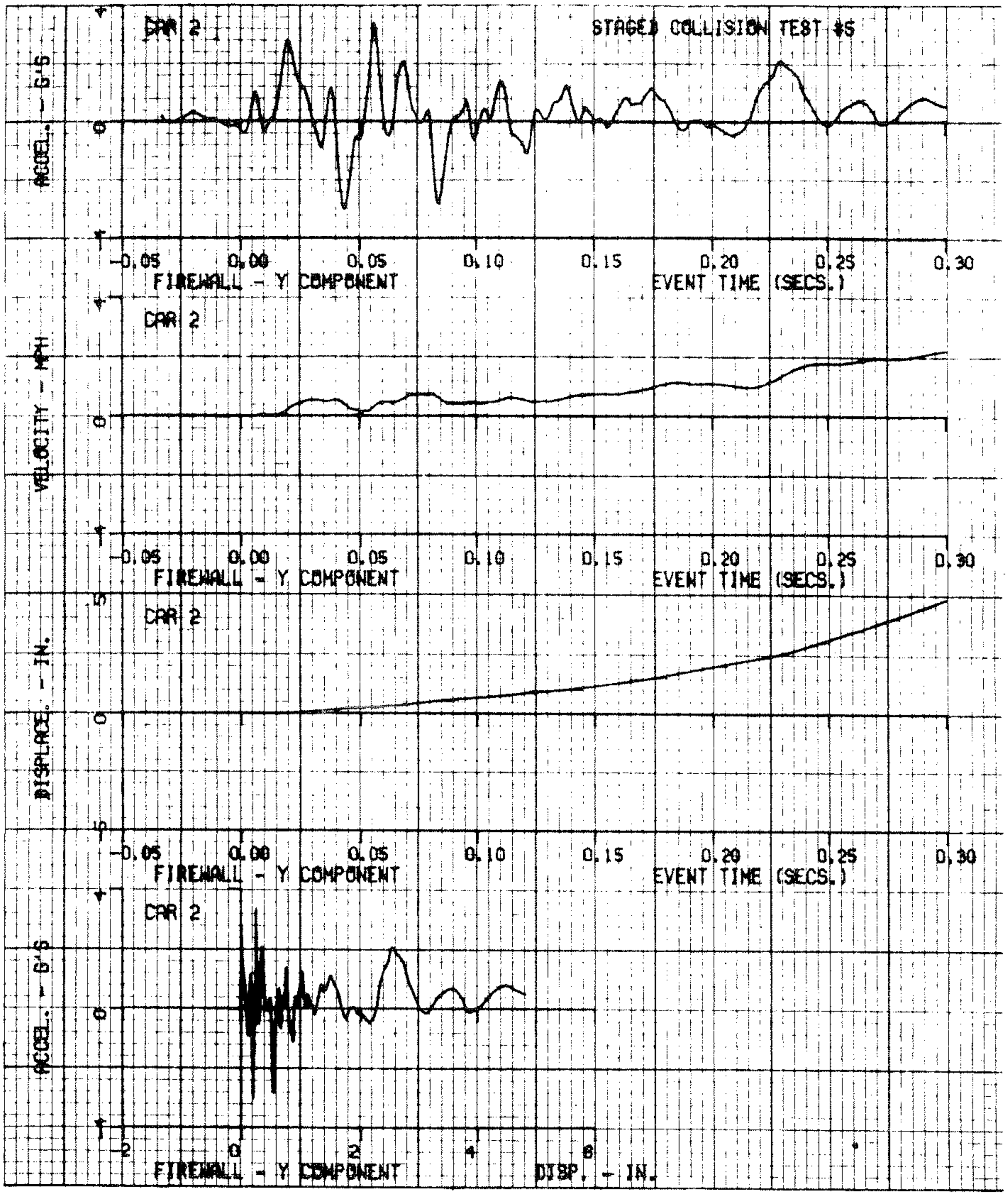

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
-10
0
10
20
LEFT REAR CORNER - Y COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S (X10^1)
LEFT REAR CORNER - Z COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S (X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
LEFT REAR CORNER-RESULTANT
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10^1)
10
0
-10
FIREWALL - X COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-40
0
40
80
120
FIREWALL - X COMPONENT
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - Y COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
-2
0
2
4
6
FIREWALL - Y COMPONENT
DISP. - IN.

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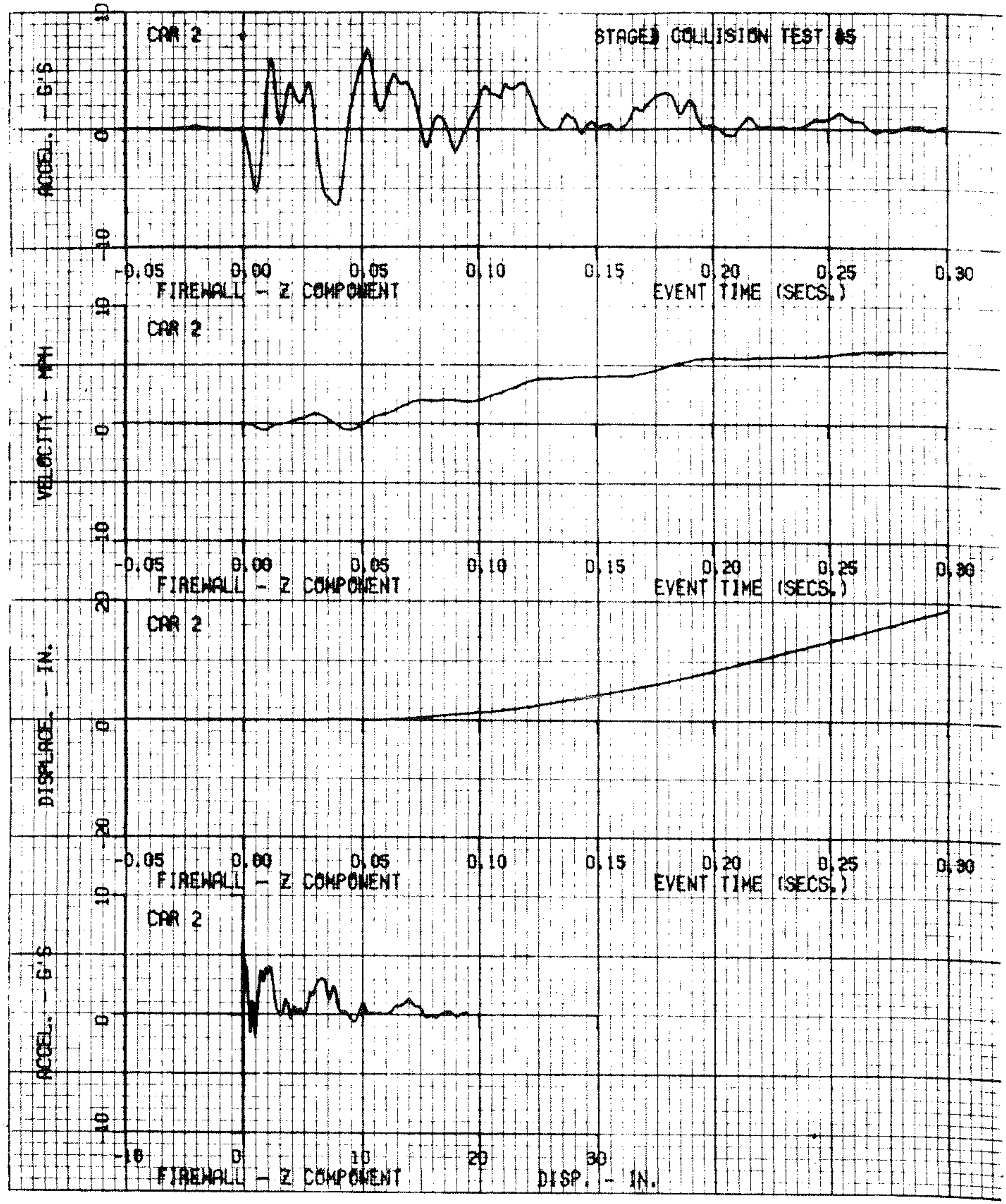
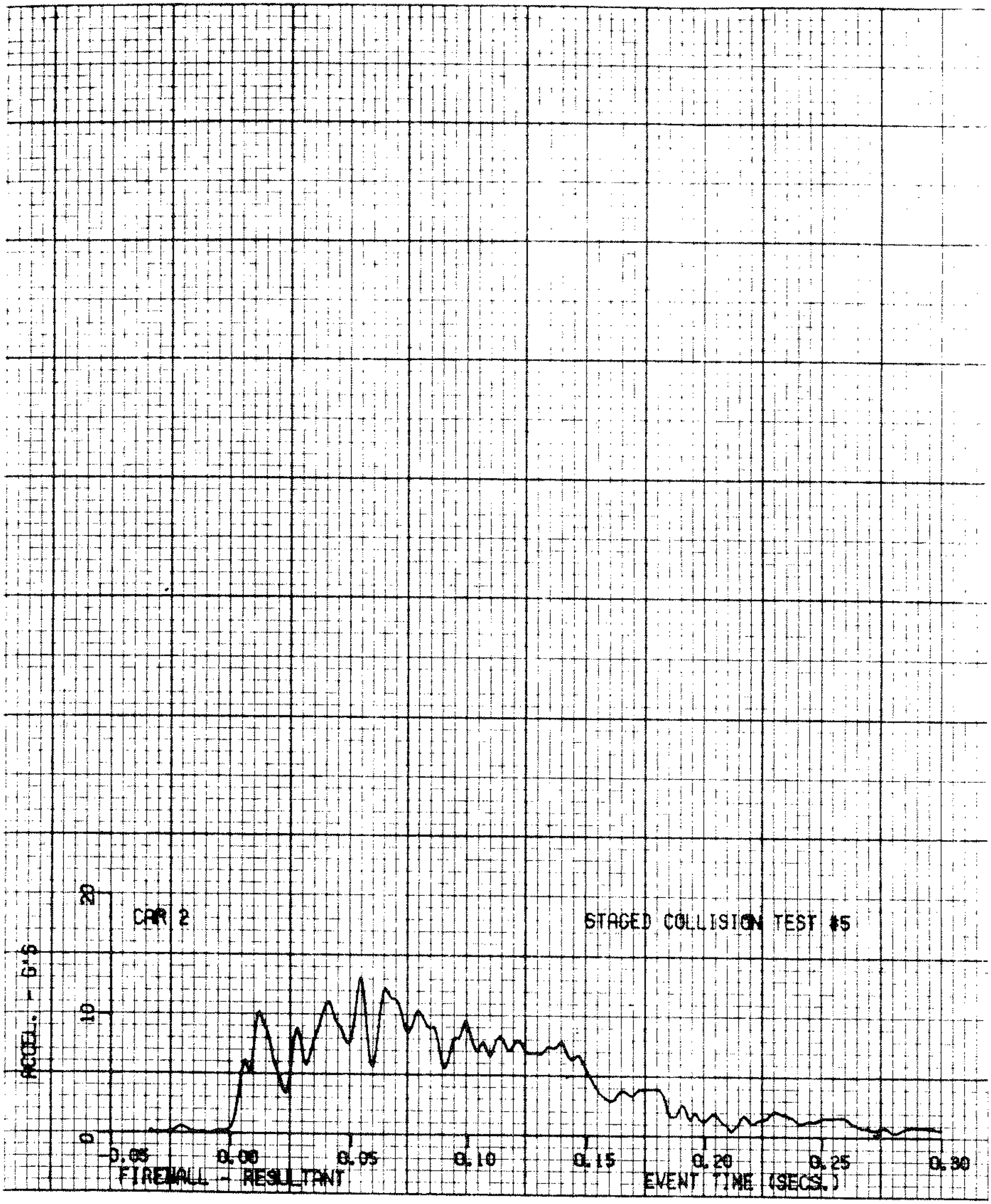
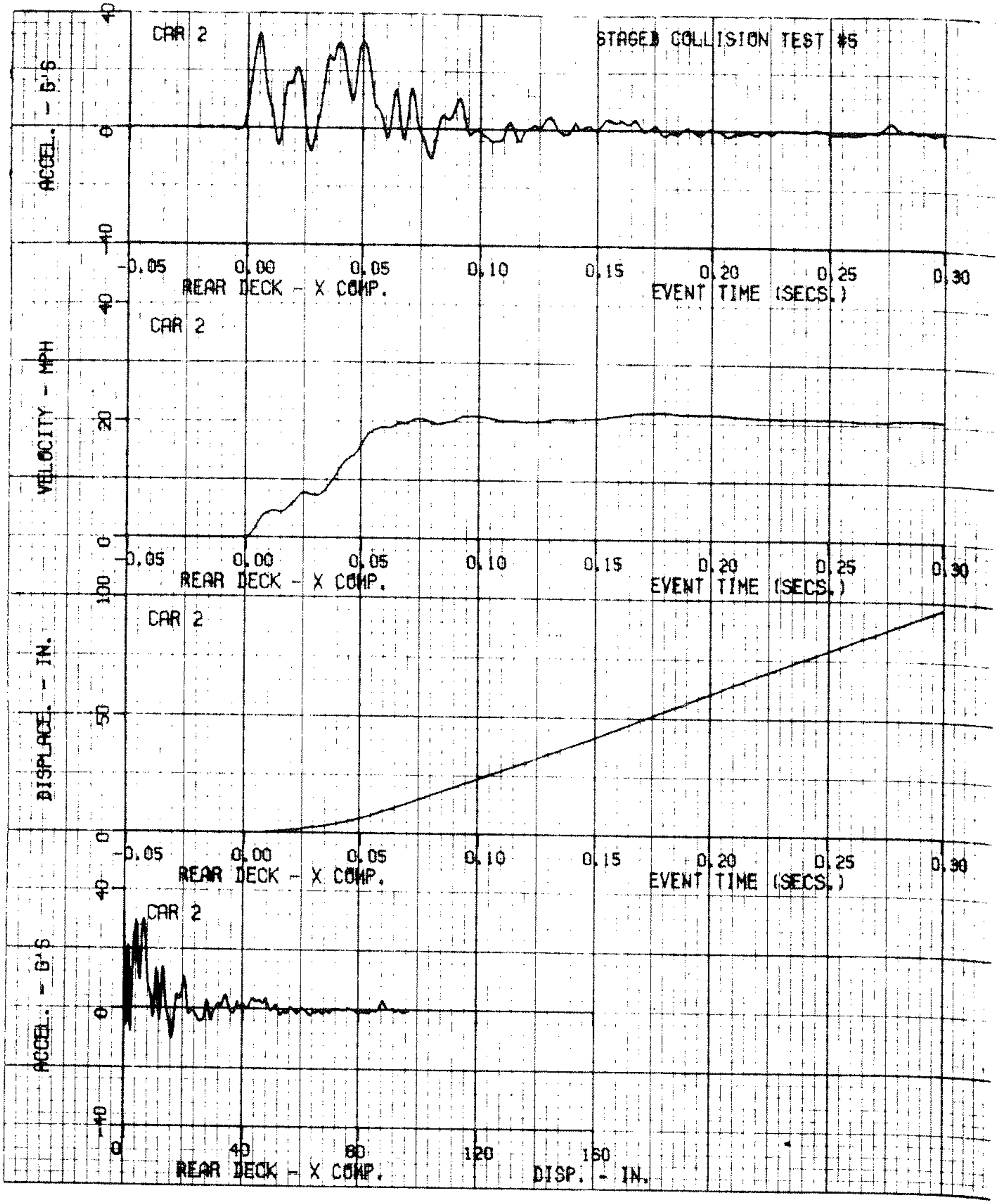
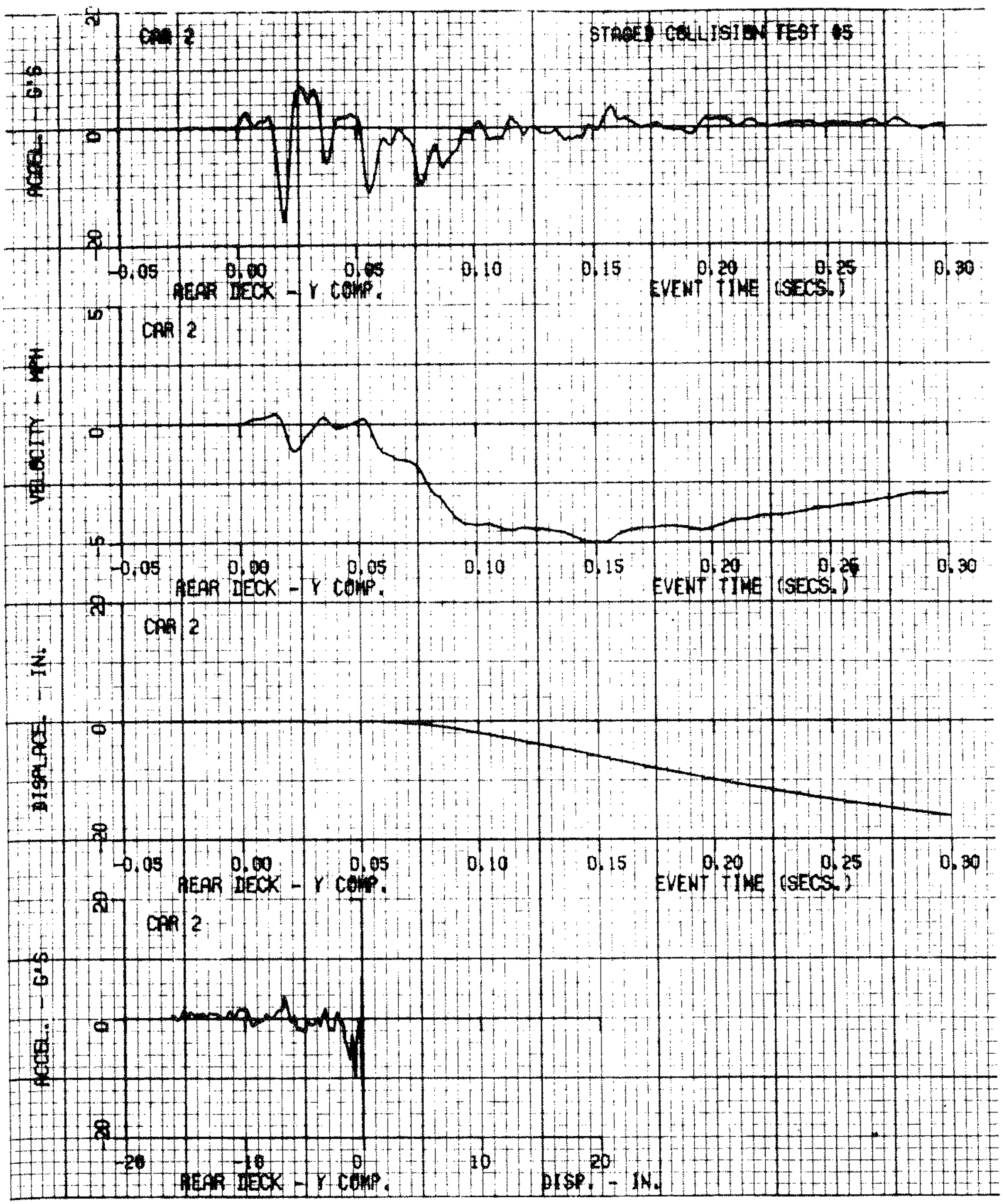

CAR 2
STAGED COLLISION TEST #5
ACCEL. — G'S
10
0
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL — Z COMPONENT
EVENT TIME (SECS.)
CAR 2
VELOCITY — MPH
10
0
10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL — Z COMPONENT
EVENT TIME (SECS.)
CAR 2
DISPLACE. — IN.
20
0
20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL — Z COMPONENT
EVENT TIME (SECS.)
CAR 2
ACCEL. — G'S
10
0
10
-10
0
10
20
30
FIREWALL — Z COMPONENT
DISP. — IN.


ACCEL. - G'S
20
10
0
CAR 2
STAGED COLLISION TEST #5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
FIREWALL - RESULTANT
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
100
50
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
0
40
80
120
160
REAR DECK - X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
5
0
-5
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
-10
0
10
20
REAR DECK - Y COMP.
DISP. - IN.

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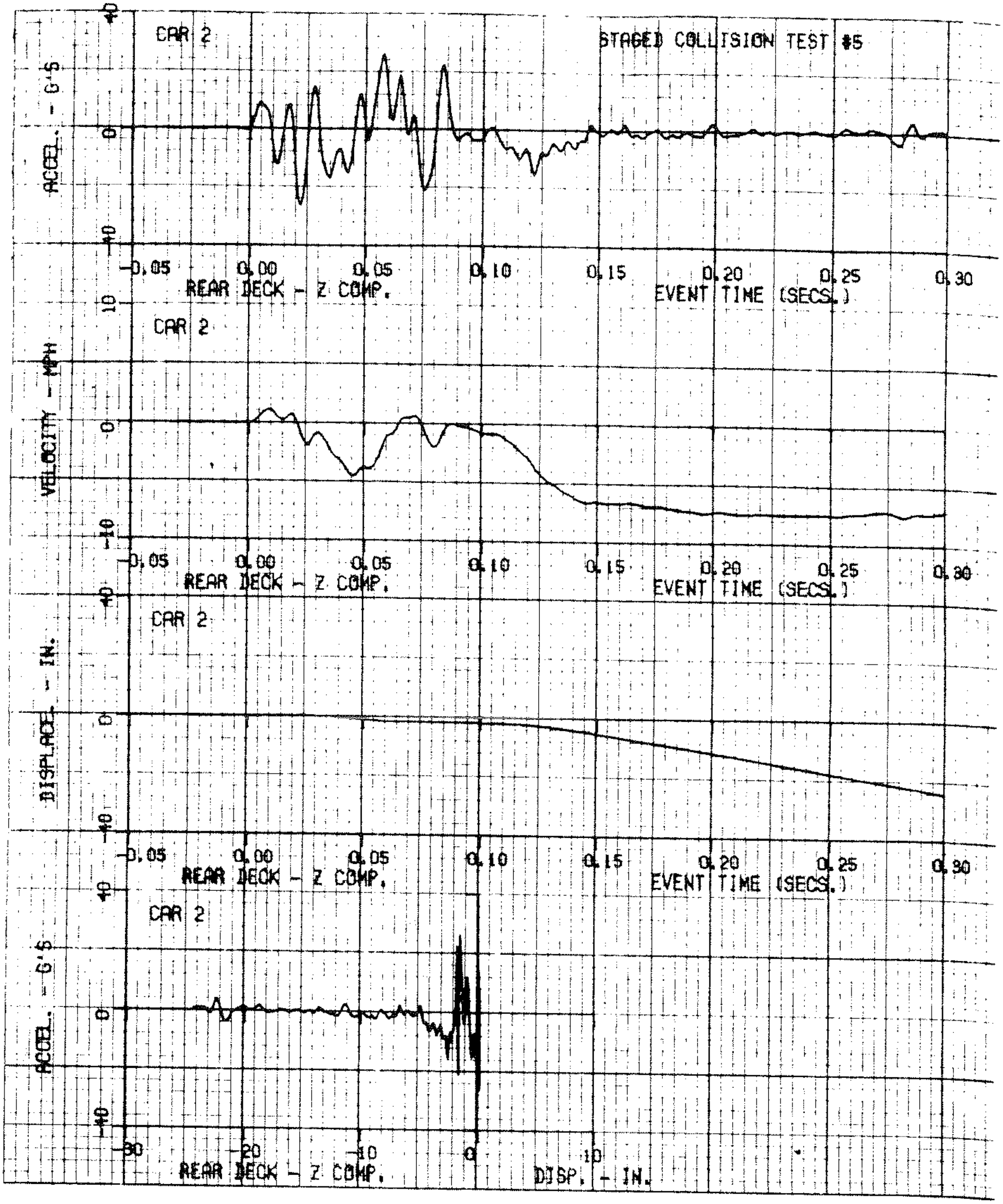

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-30
-20
-10
0
10
REAR DECK - Z COMP.
DISP. - IN.

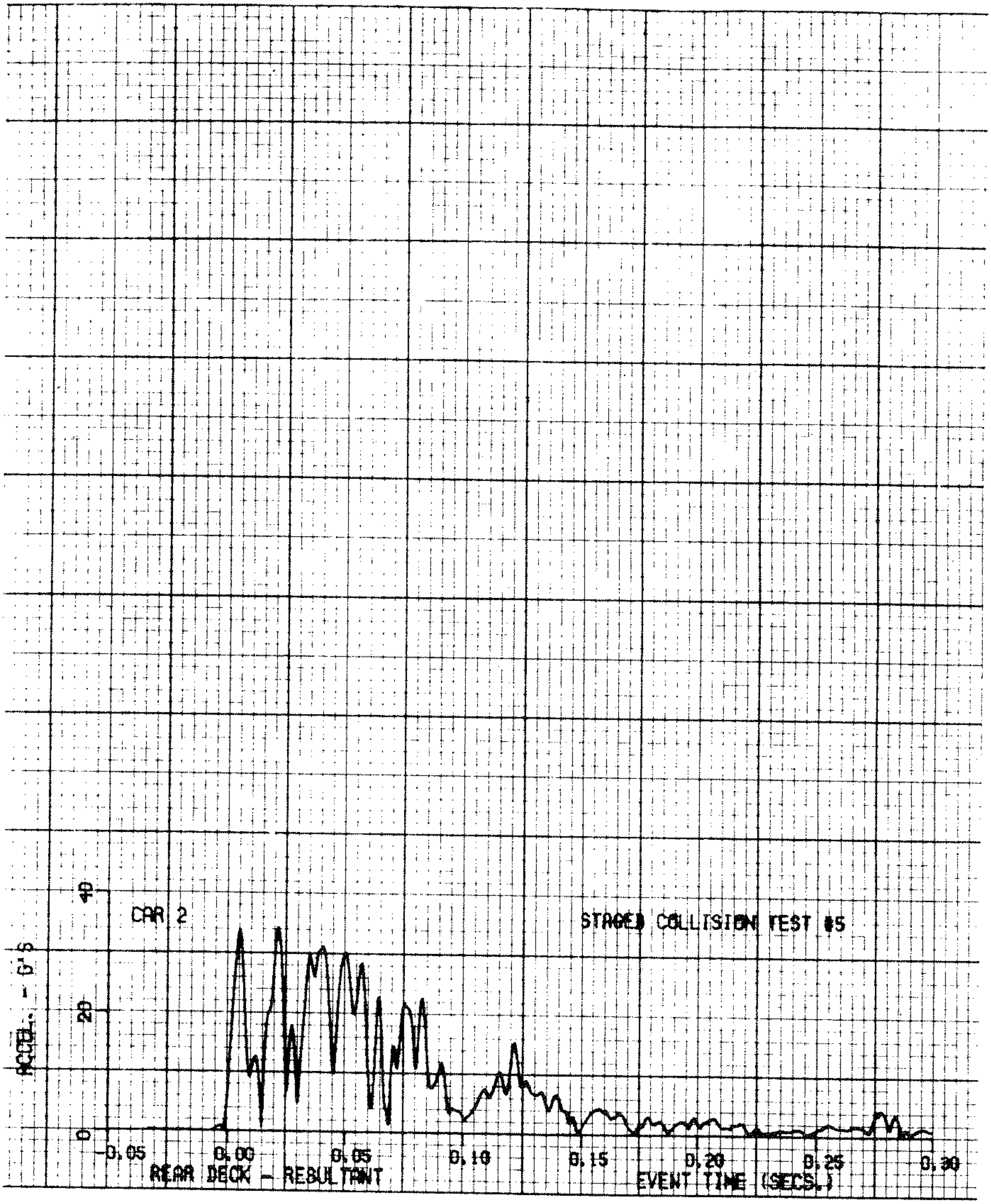

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
REAR DECK - RESULTANT
EVENT TIME (SECS.)

Table 7

DUMMY INJURY CRITERIA VALUES

CAR 2 - STRUCK VEHICLE

	MAXIMUM ACCELERATION ("G") *											
	HEAD				CHEST				PELVIS			
	X	Y	Z	R	X	Y	Z	R	X	Y	Z	R
DUMMY (1)	100	-20	50	105	50	-20	26	60	50	--	--	--
DUMMY (2)	29	***	20	**** 35	17	17	9	19	45			
DUMMY (3)												
DUMMY (4)												

	MAXIMUM FORCE-FEMUR LOAD (LBS)	
	RIGHT FEMUR	LEFT FEMUR
DUMMY (1)	-120	-120
DUMMY (2)	100	100
DUMMY (3)		
DUMMY (4)		

	MAXIMUM FORCE-SEAT BELTS LOADS (LBS)		
	SHOULDER STRAP UPPER BELT LOAD	LAP STRAP RIGHT BELT LOAD	LAP STRAP LEFT BELT LOAD
DUMMY (1)			
DUMMY (2)			
DUMMY (3)			
DUMMY (4)			

	HEAD INJURY CRITERIA**				SEVERITY INDEX	
	HIC	t_1 (SEC)	t_2 (SEC)	AVE. ACC. (g) t_1 TO t_2	HEAD	CHEST
DUMMY (1)	899.5	.110	.129	73.8	1167	340
DUMMY (2)	67.8	.116	.177	16.6	107	66
DUMMY (3)						
DUMMY (4)						

*DEFINED AS EXCEEDING 0.003 SEC. DURATION

**AS DEFINED IN FMVSS NO. 208

***DATA LOST DUE TO CUT WIRE

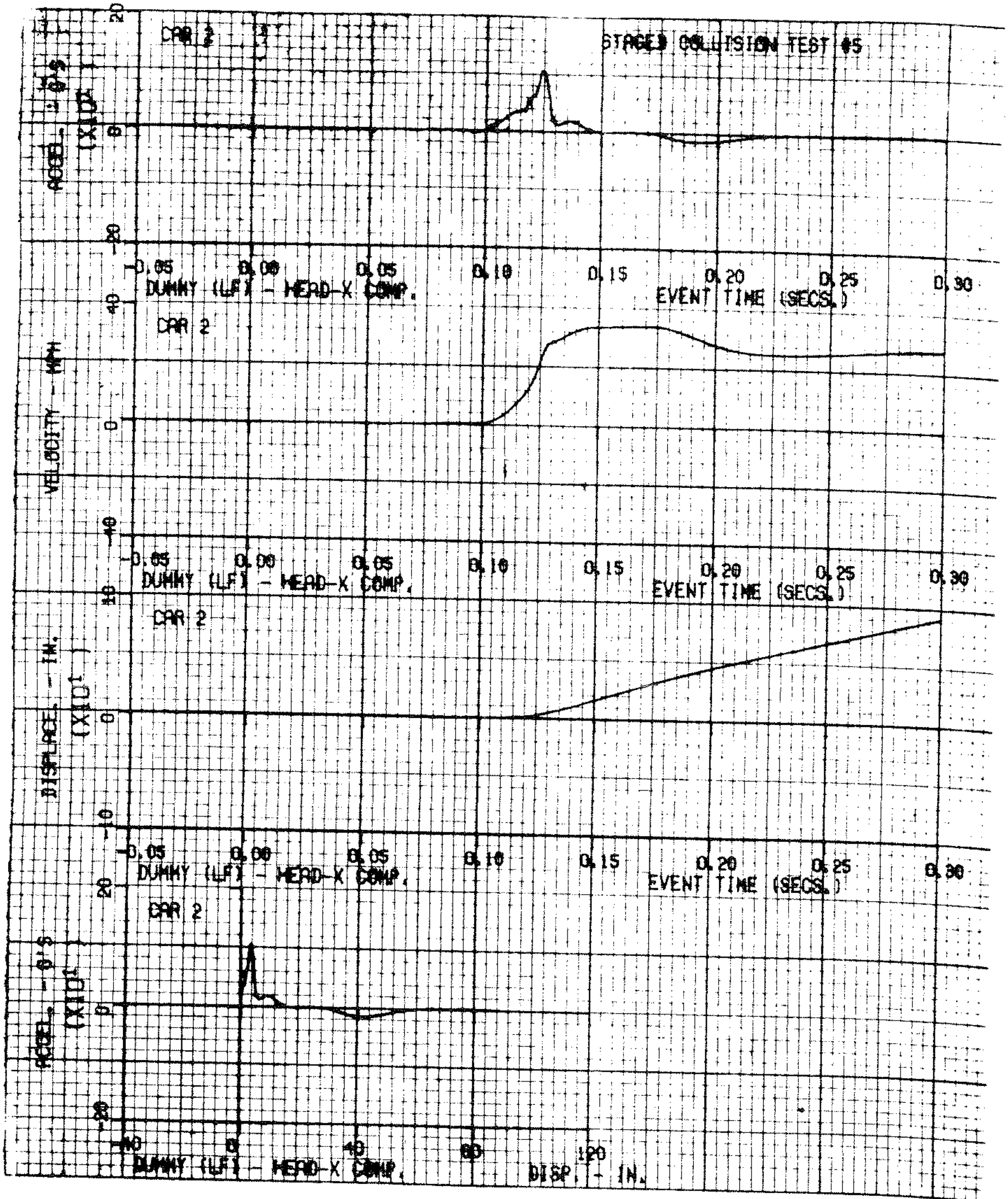
****RESULTANT OF X AND Z ONLY

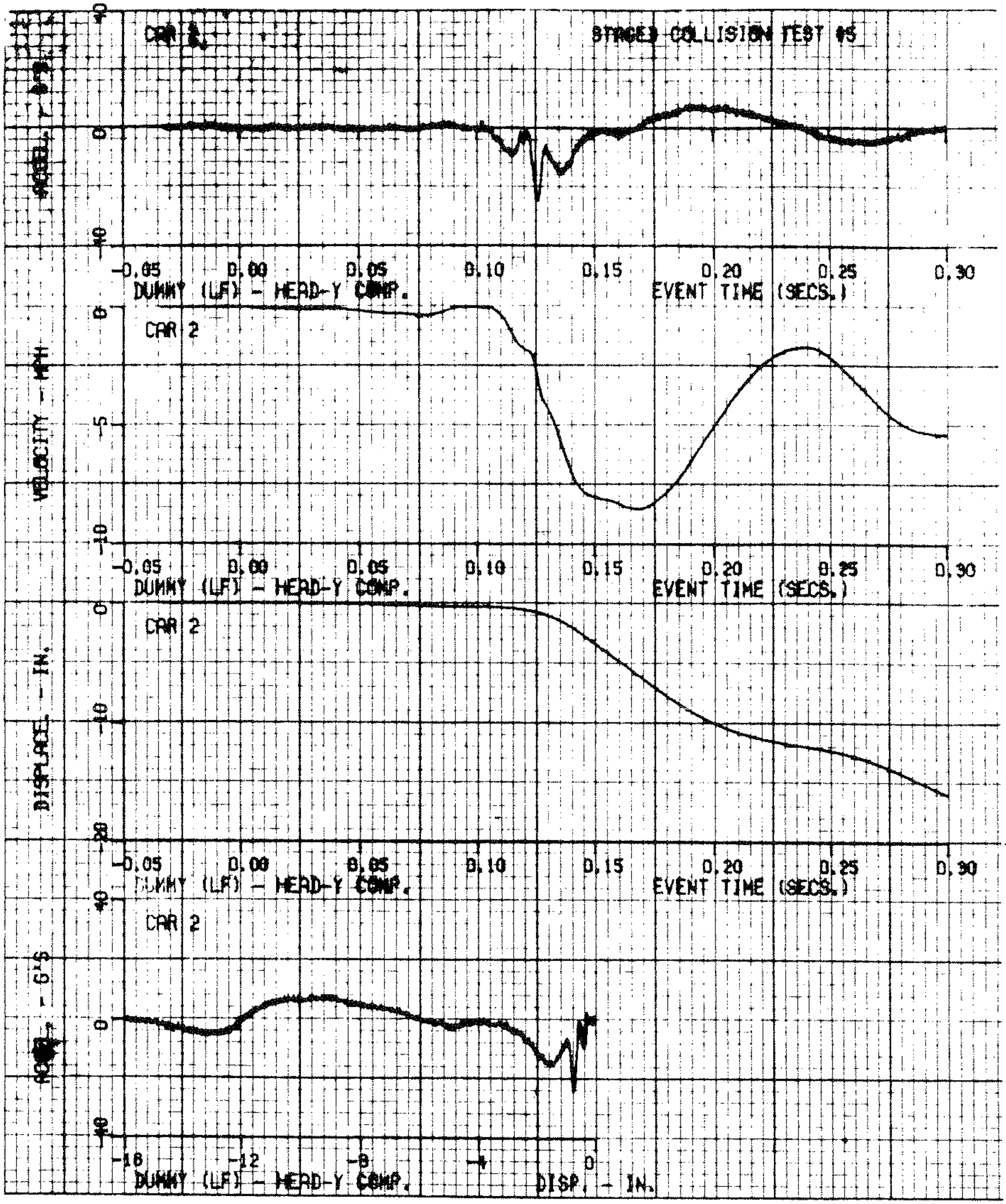
RICSAC TEST NO. 5

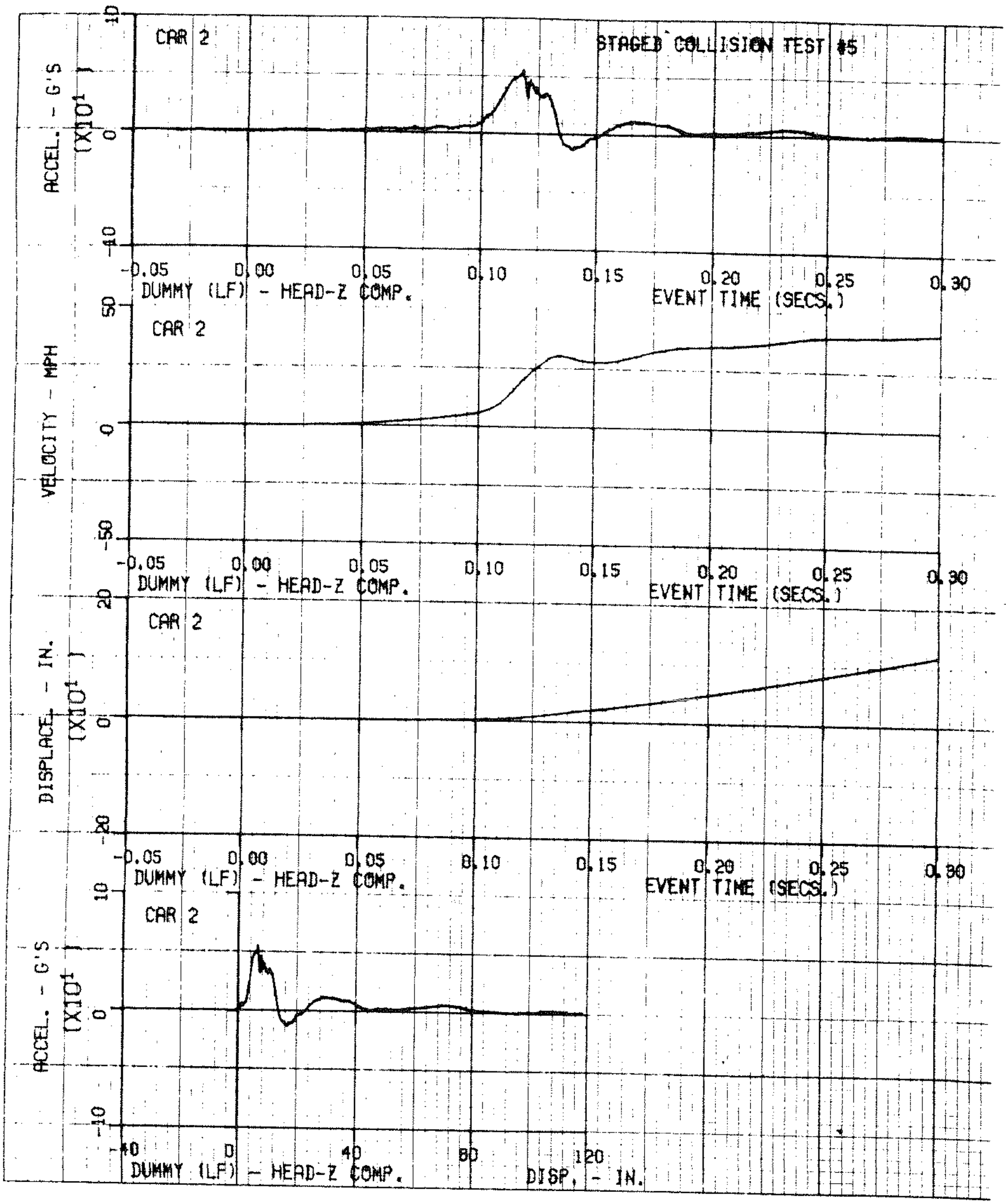
DUMMY DATA

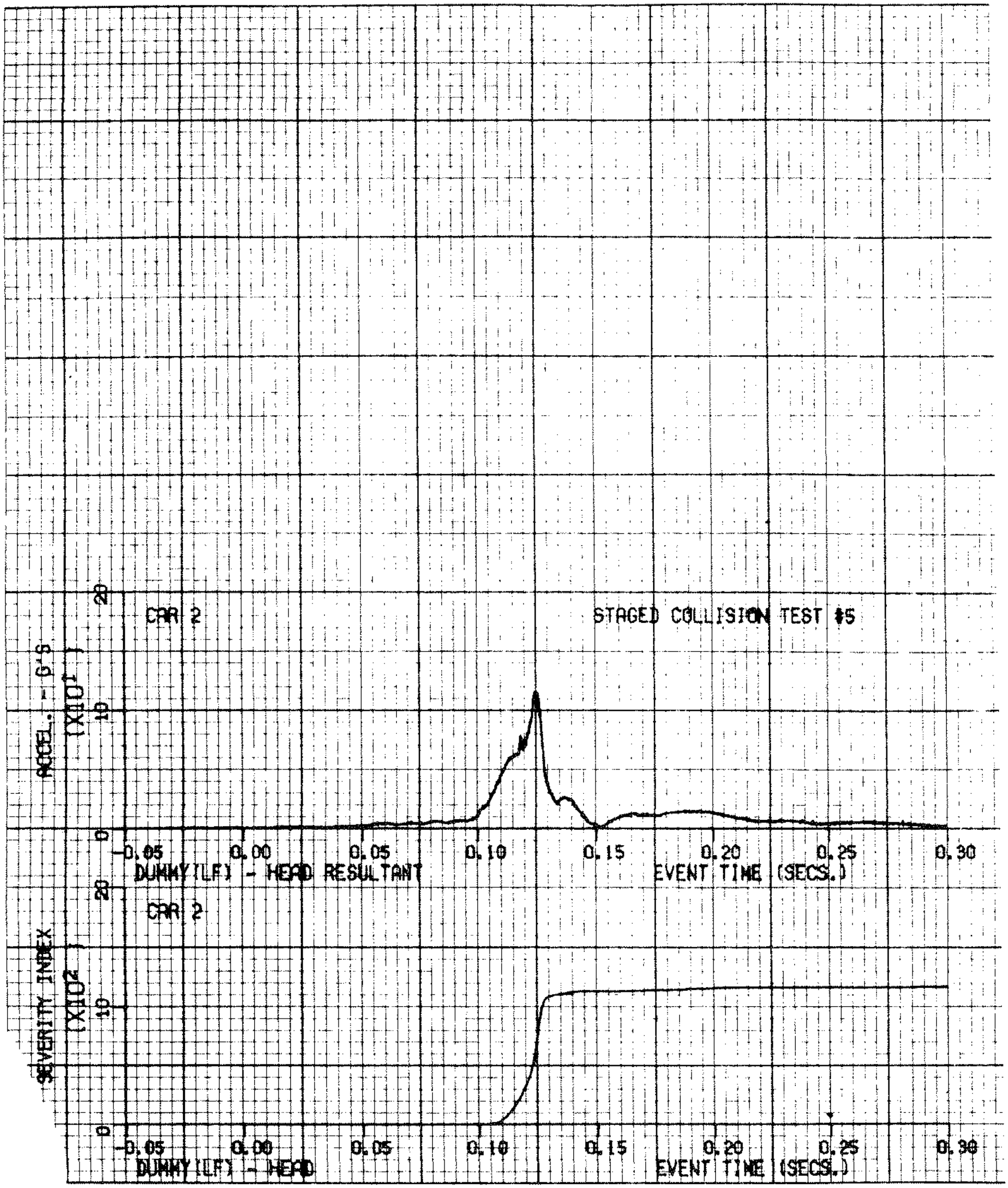
CAR NO. 2 HONDA

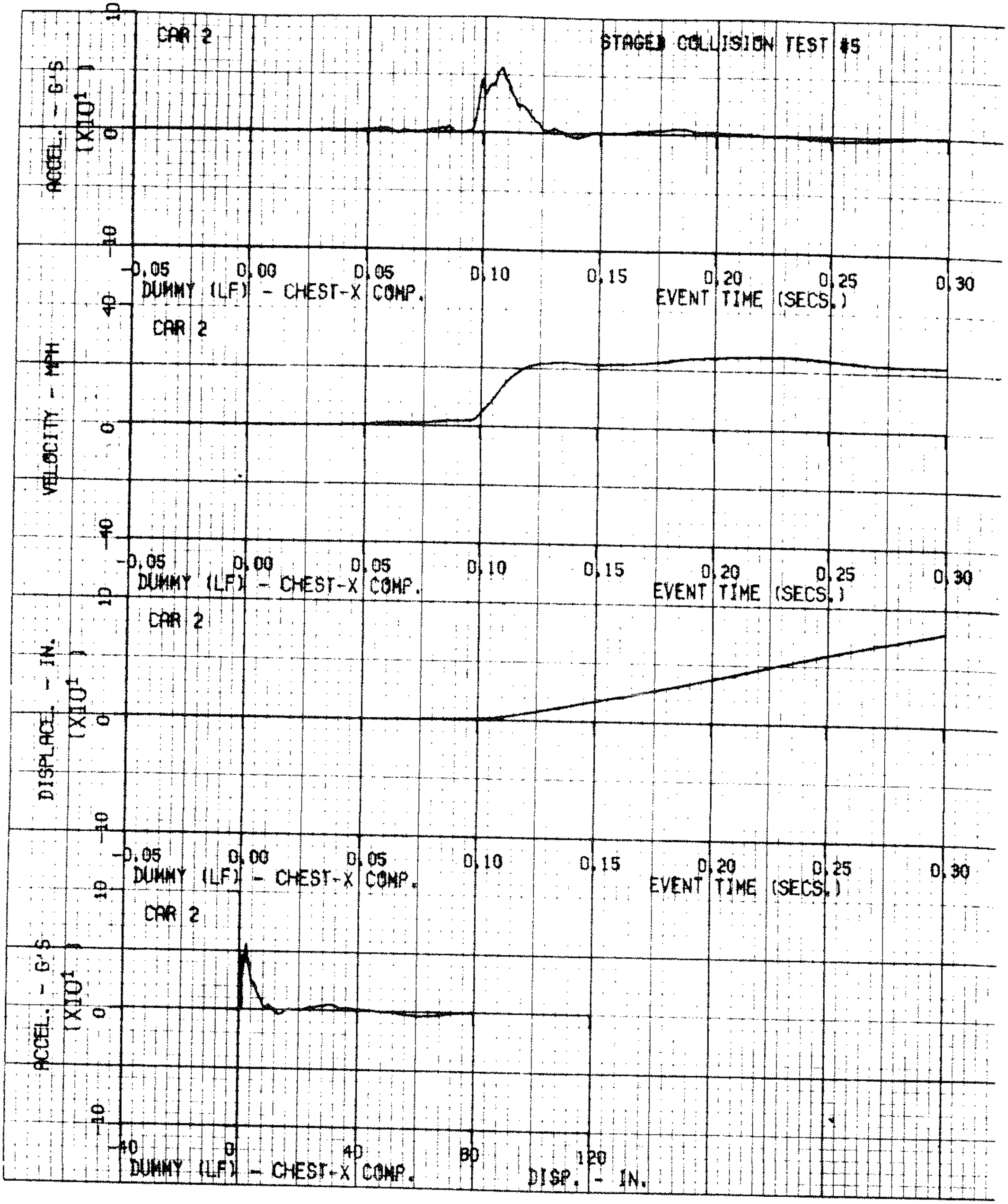
DATA PLOTS		FILTER CLASS
HEAD ACCELERATION	X,Y,X	1000
HEAD RESULTANT		
HEAD SEVERITY INDEX		
CHEST ACCELERATION	X,Y,Z	180
CHEST RESULTANT		
CHEST VELOCITY	X,Y,Z	
CHEST DISPLACEMENT	X,Y,Z	
CHEST SEVERITY INDEX		
PELVIC ACCELERATION	X	180
PELVIC VELOCITY	X	
PELVIC DISPLACEMENT	X	
FEMUR LOADS	L & R	600

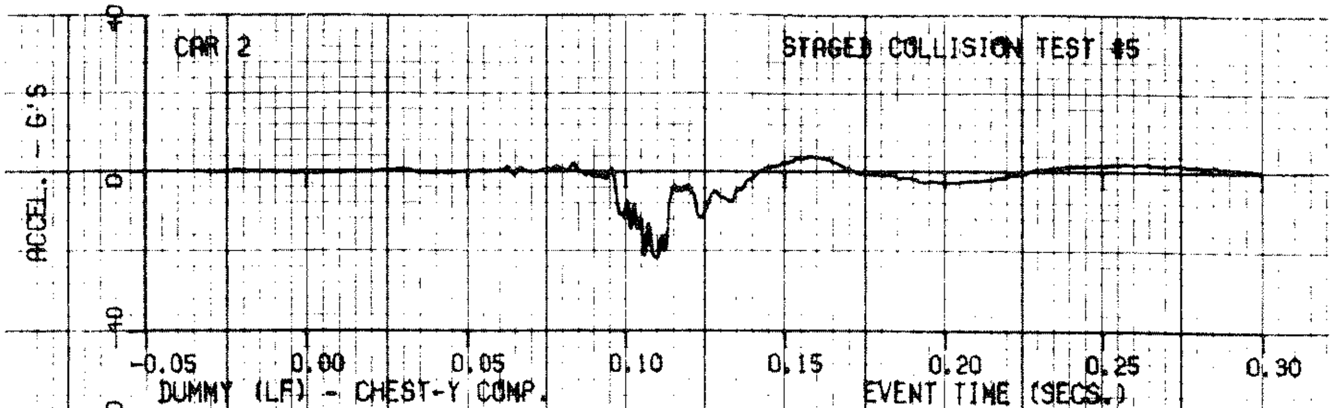

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S (X10¹)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
20
0
-20
-40
0
40
80
120
DUMMY (LF) - HEAD-X COMP.
DISP. - IN.

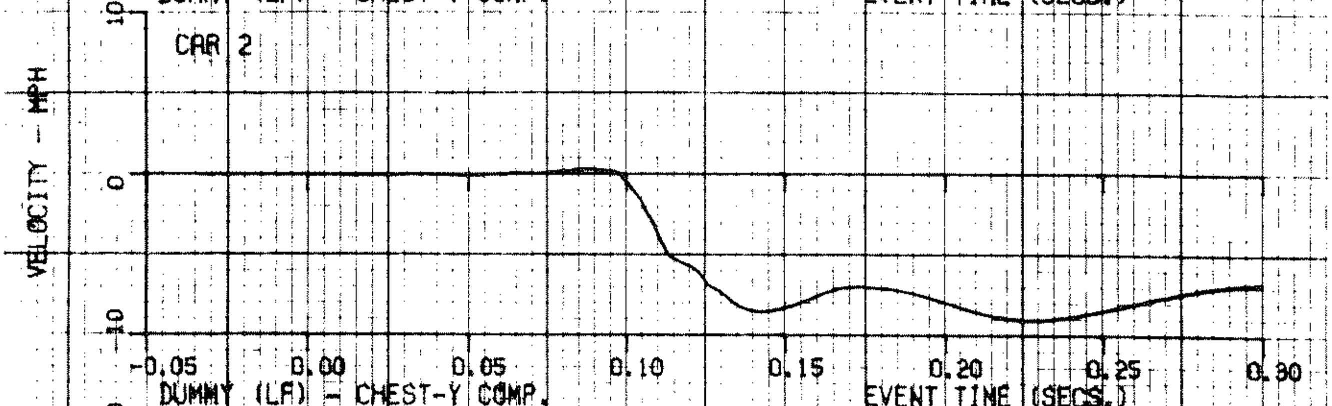

STAGED COLLISION TEST #5
CAR 2
ACCEL. - G'S
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
0 -5 -10
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
0 -10 -20
DUMMY (LF) - HEAD-Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40 0 -40
-16 -12 -8 -4 0
DUMMY (LF) - HEAD-Y COMP.
DISP. - IN.

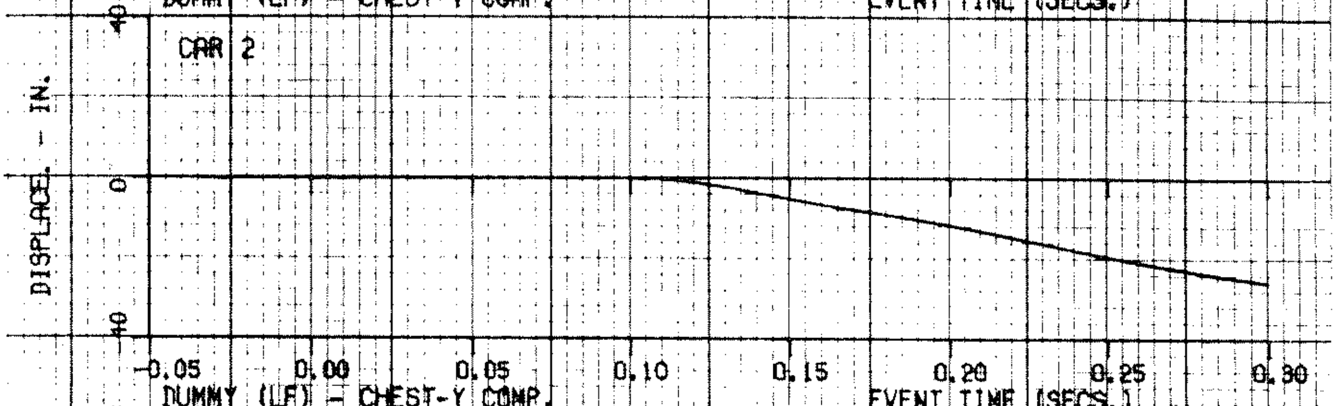

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S [X10¹]
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
50
0
-50
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. [X10¹]
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S [X10¹]
10
0
-10
-40
0
40
80
120
DUMMY (LF) - HEAD-Z COMP.
DISP. - IN.

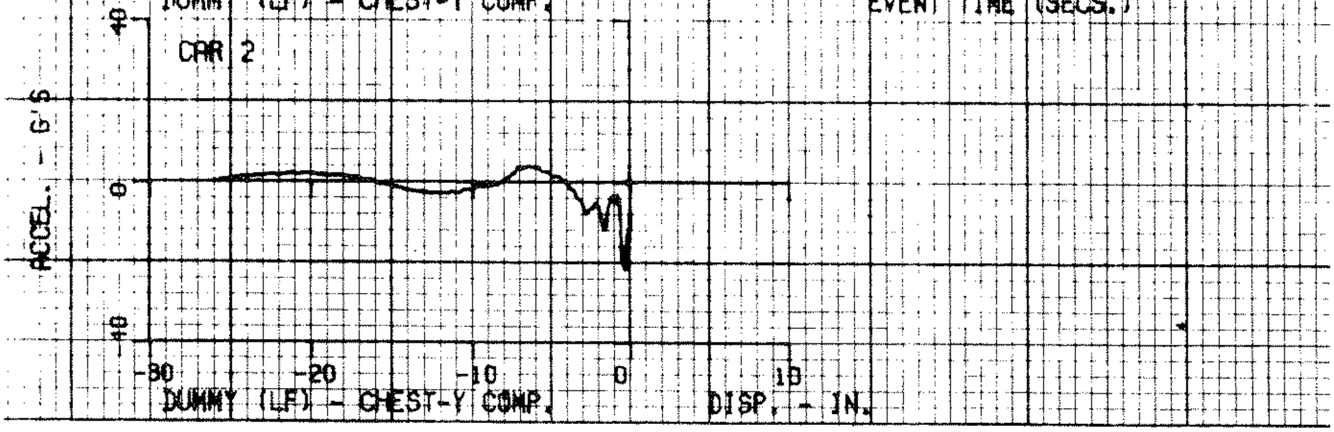

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
(X10¹)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - HEAD RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
(X10²)
20
10
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - HEAD
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN. (X10¹)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S (X10¹)
10
0
-10
-40
0
40
80
120
DUMMY (LF) - CHEST-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
VELOCITY - MPH
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Y COMP.
EVENT TIME (SECS.)


CAR 2
ACCEL. - G'S
40
0
-40
-30
-20
-10
0
10
DUMMY (LF) - CHEST-Y COMP.
DISP. - IN.

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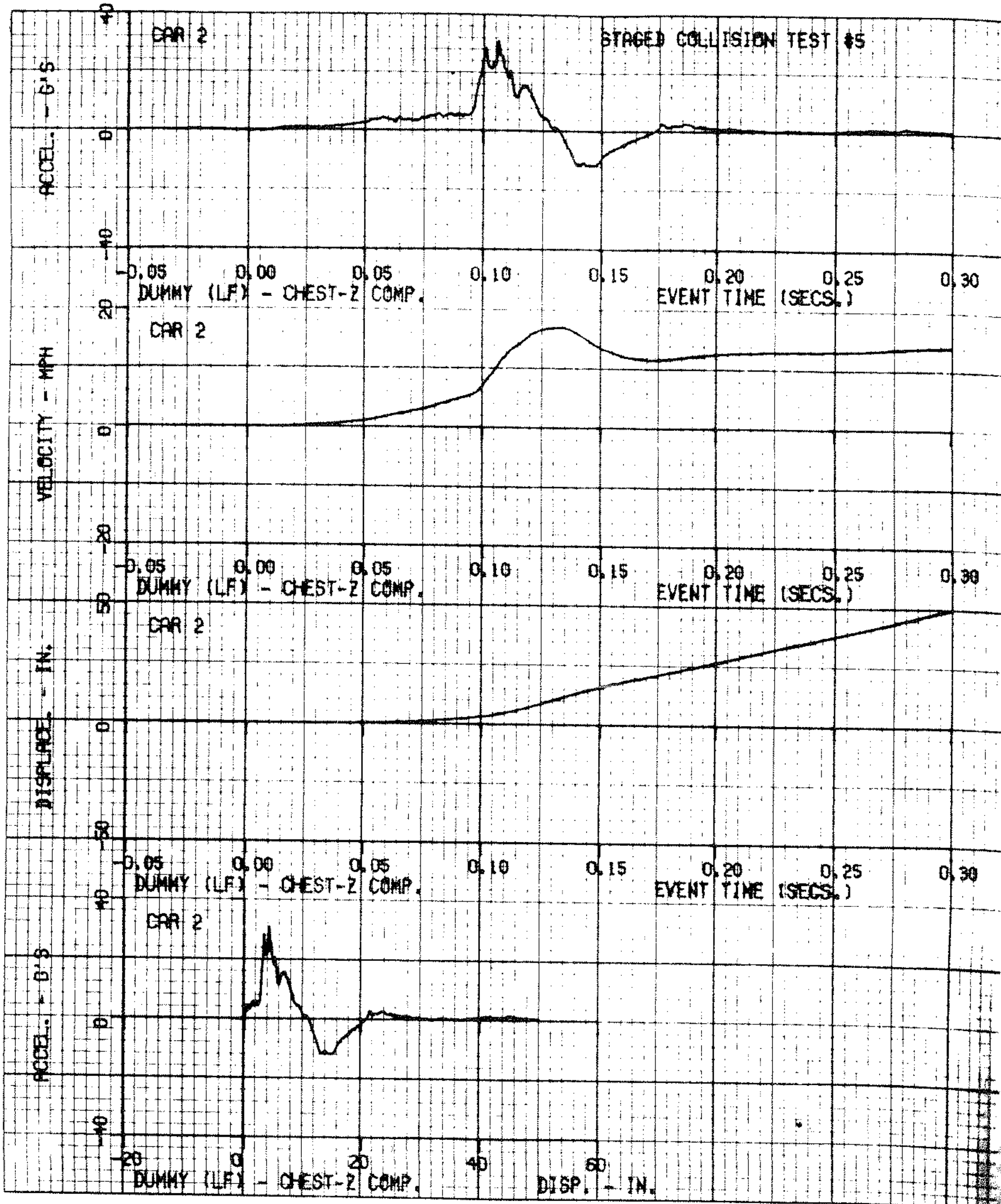
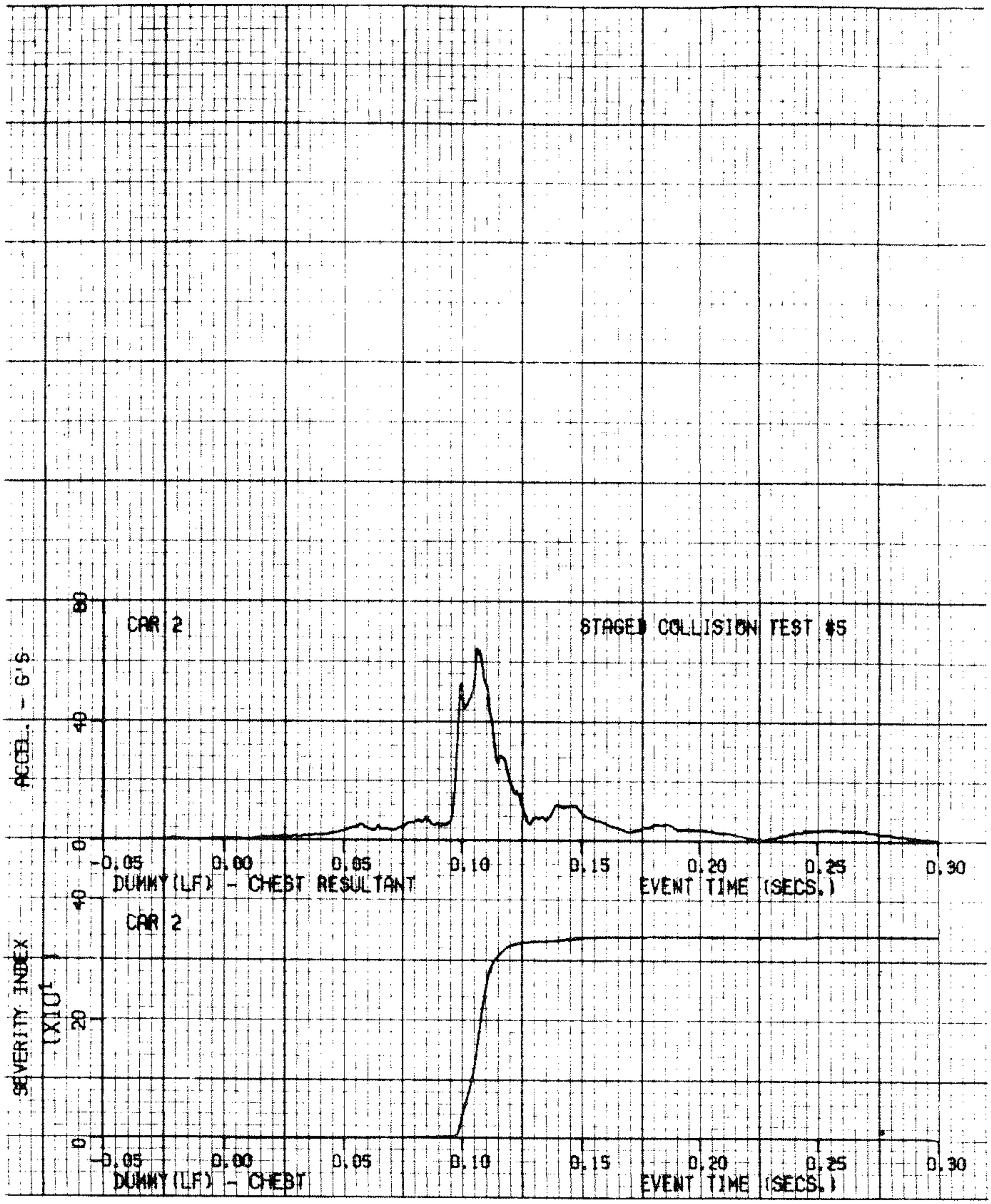
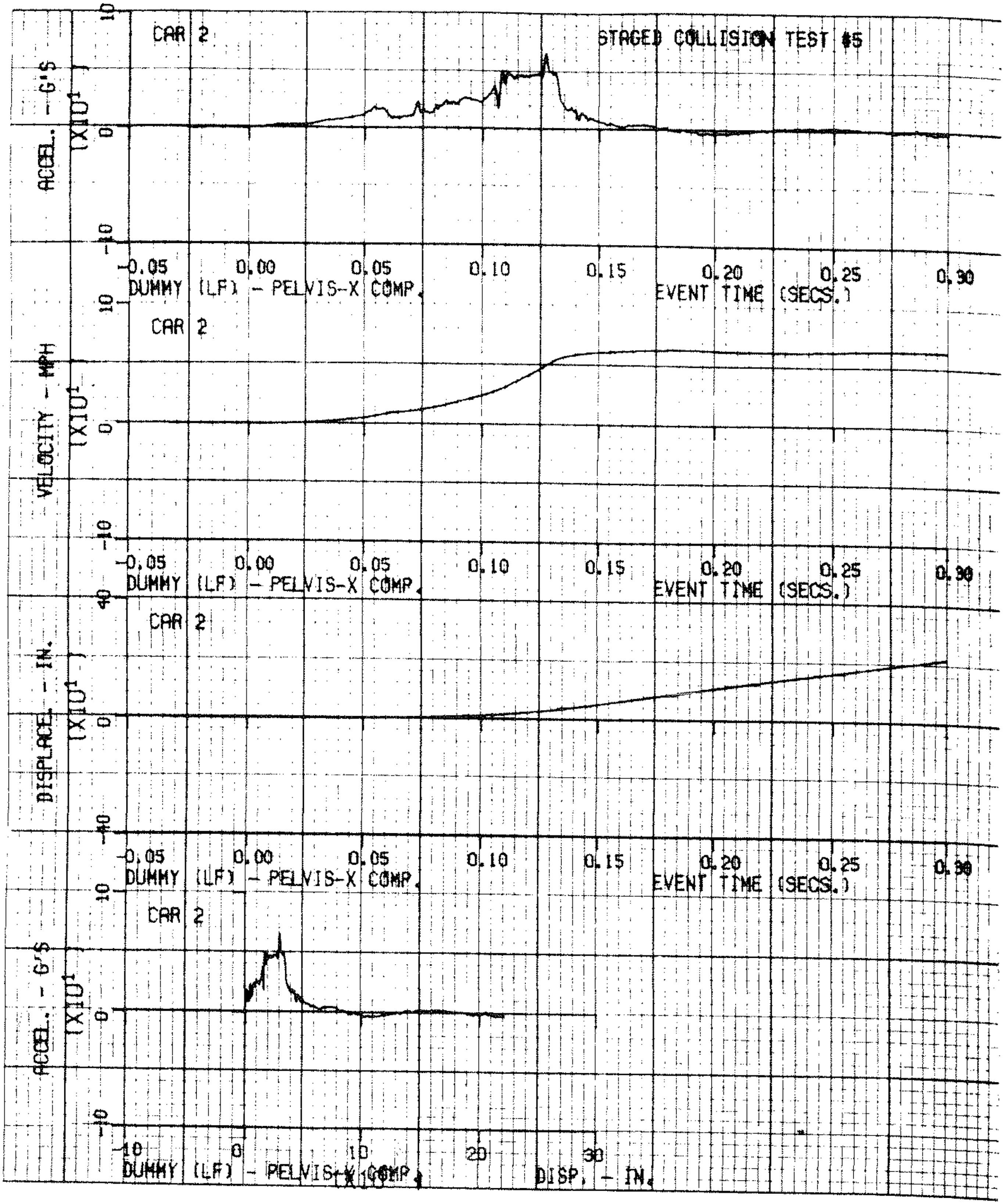
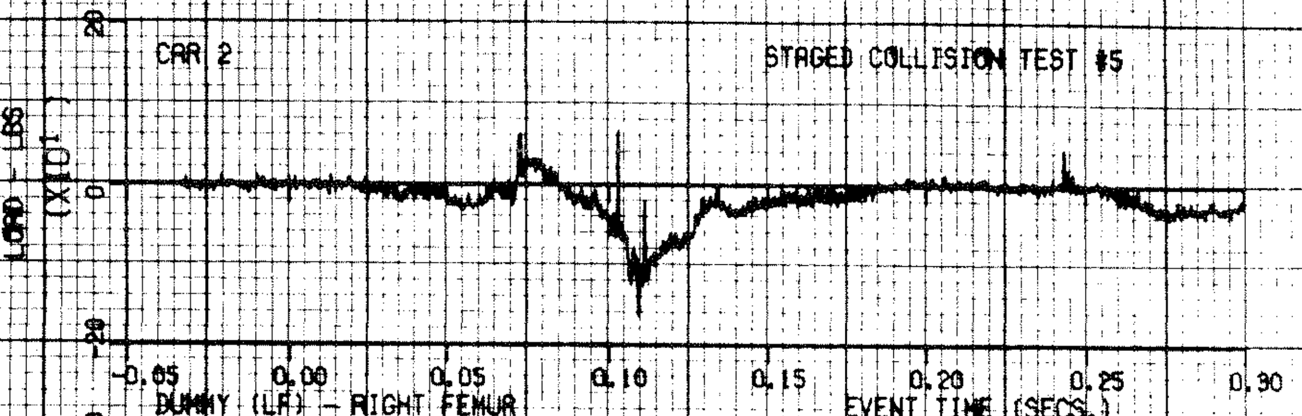
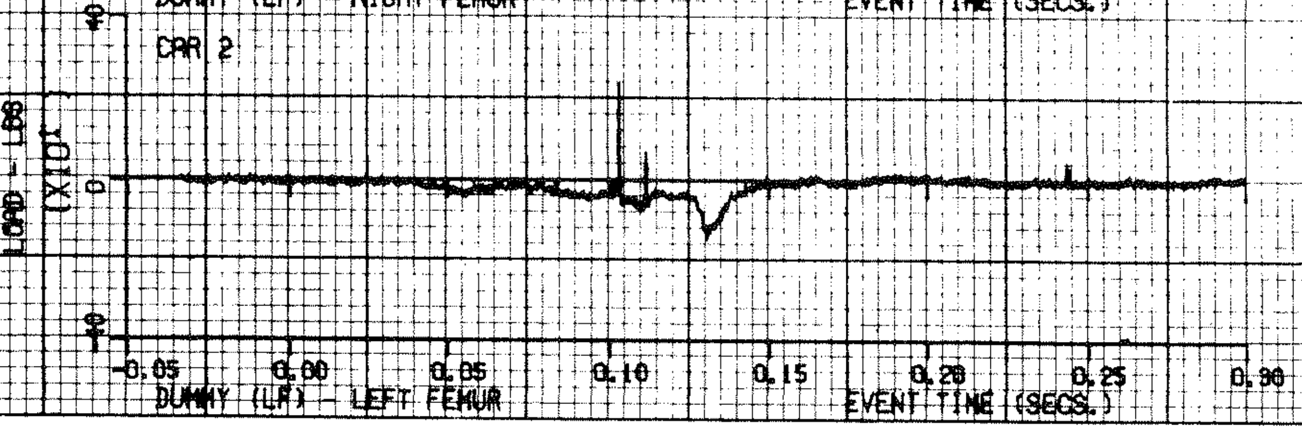
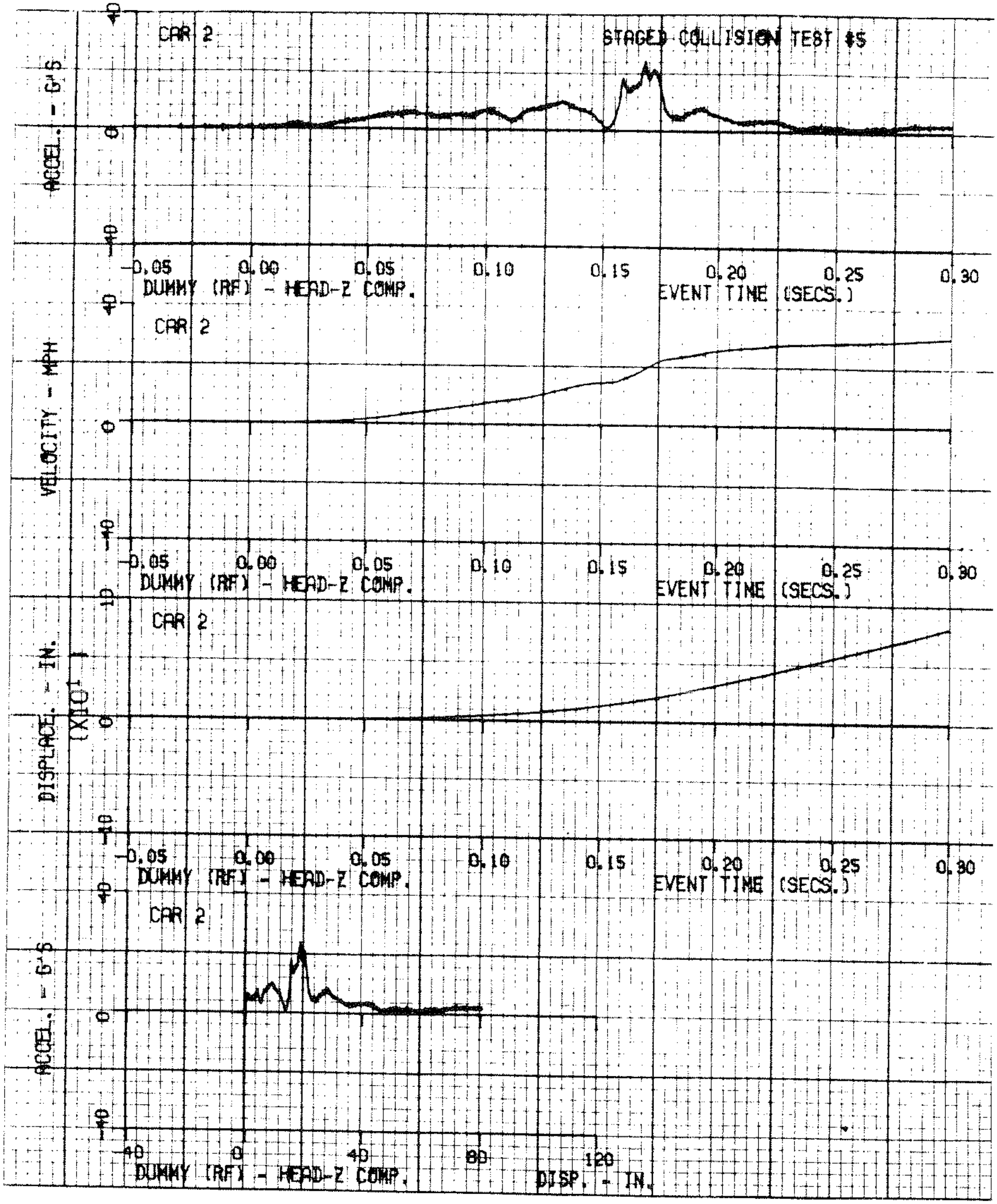

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
50
0
-50
DUMMY (LF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-20
0
20
40
60
DUMMY (LF) - CHEST-Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - CHEST RESULTANT
EVENT TIME (SECS.)
CAR 2
SEVERITY INDEX
(X10¹)
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(LF) - CHEST
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
[X10¹]
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
[X10¹]
10
0
-10
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
[X10¹]
40
0
-40
DUMMY (LF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
[X10¹]
10
0
-10
-10
0
10
20
30
DUMMY (LF) - PELVIS-X COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
LOAD - LBS (X10¹)
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - RIGHT FEMUR
EVENT TIME (SECS.)


CAR 2
LOAD - LBS (X10¹)
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (LF) - LEFT FEMUR
EVENT TIME (SECS.)


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10^1)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - HEAD-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
40
0
-40
-40
0
40
80
120
DUMMY (RF) - HEAD-Z COMP.
DISP. - IN.

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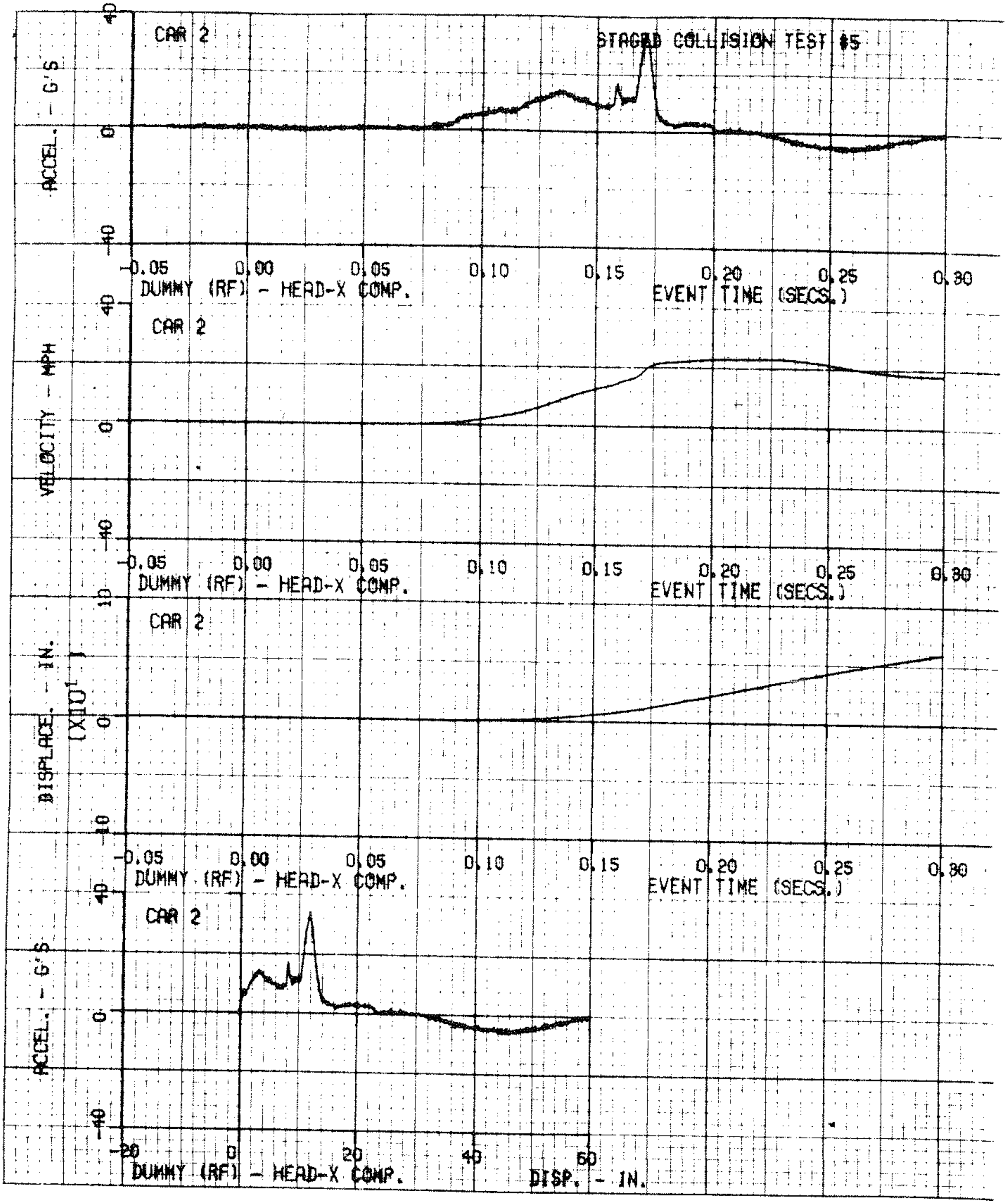
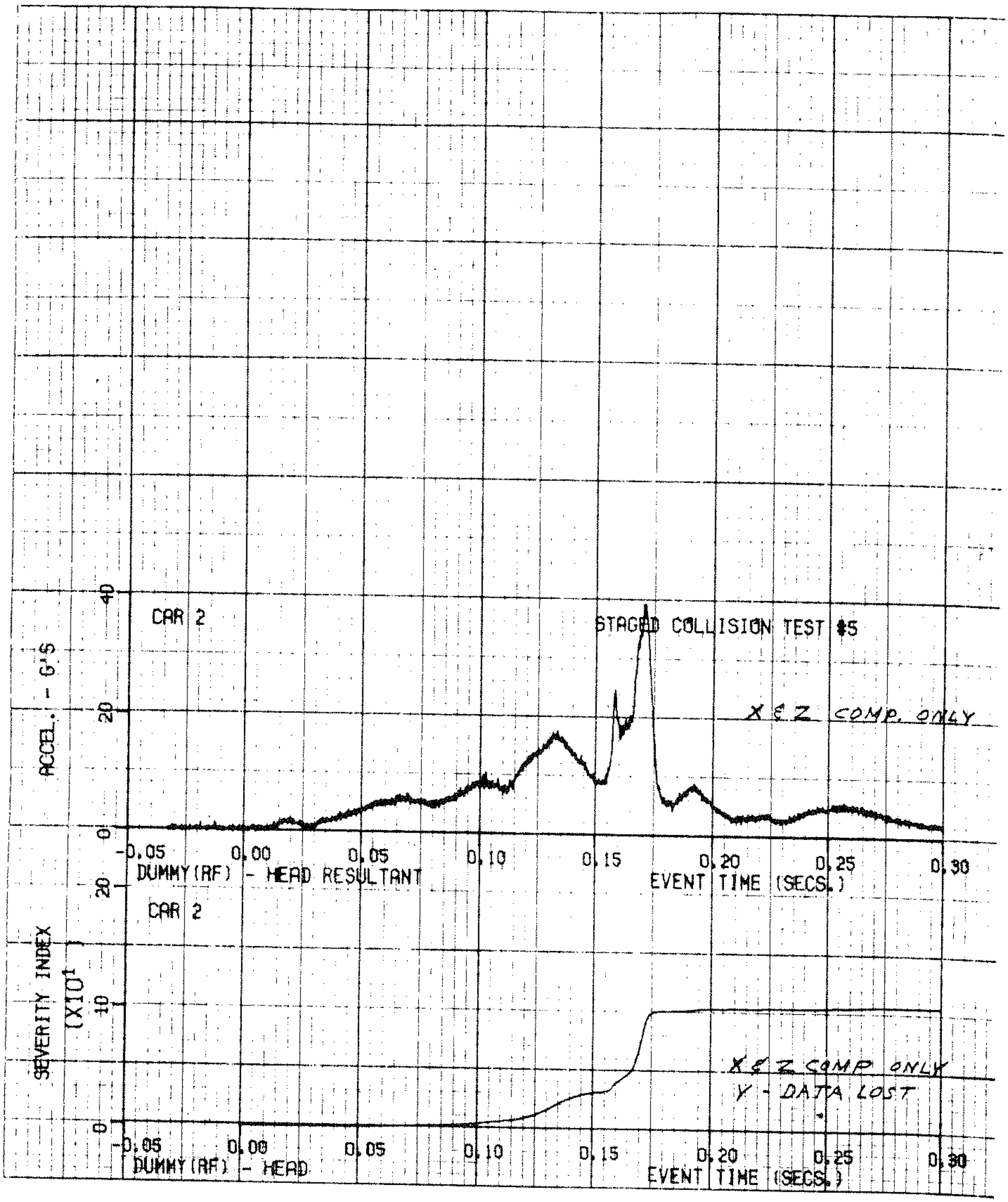
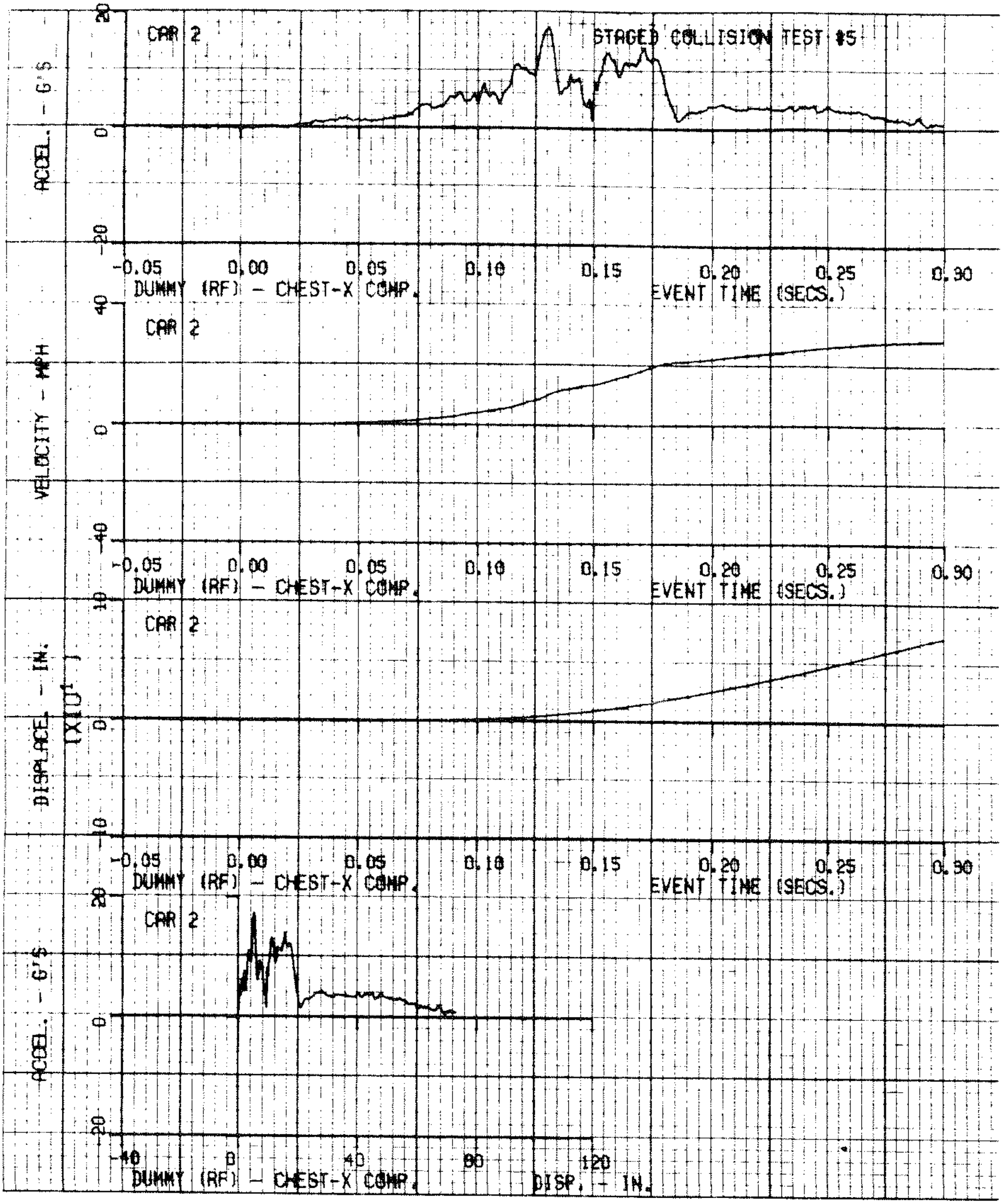

STAGED COLLISION TEST #5
CAR 2
ACCEL. - G'S
DUMMY (RF) - HEAD-X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
DISPLACE. - IN. [X10¹]
DISP. - IN.


ACCEL. - G'S
40
20
0
CAR 2
STAGED COLLISION TEST #5
X & Z COMP. ONLY
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - HEAD RESULTANT
EVENT TIME (SECS.)
SEVERITY INDEX (X10¹)
20
10
0
CAR 2
X & Z COMP ONLY
Y - DATA LOST
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY(RF) - HEAD
EVENT TIME (SECS.)


STAGED COLLISION TEST #5
CAR 2
ACCEL. - G'S
20
0
-20
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - CHEST-X COMP.
EVENT TIME (SECS.)
VELOCITY - MPH
40
0
-40
DISPLACE. - IN.
[X10^1]
10
0
-10
-40 0 40 80 120
DISP. - IN.

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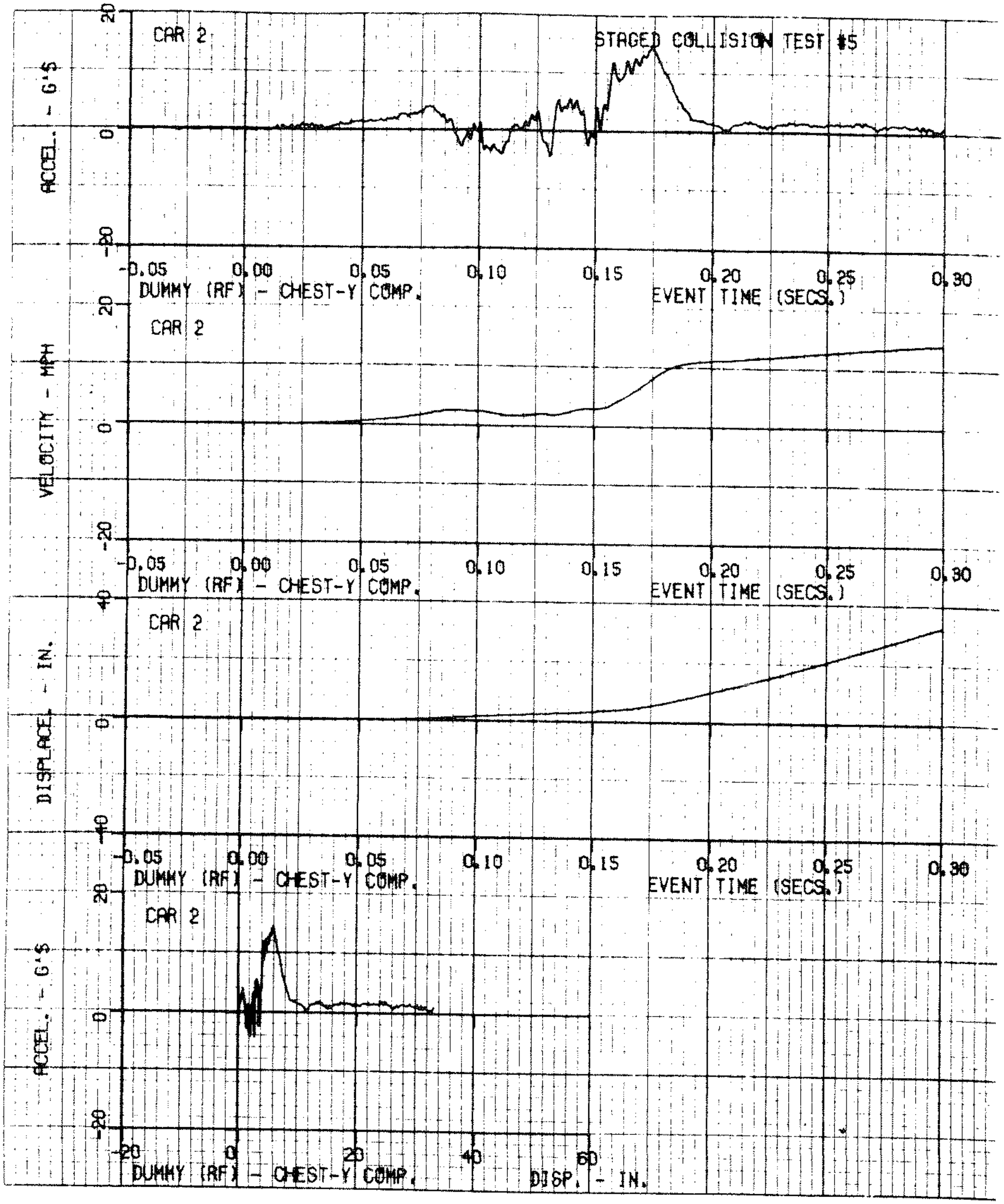
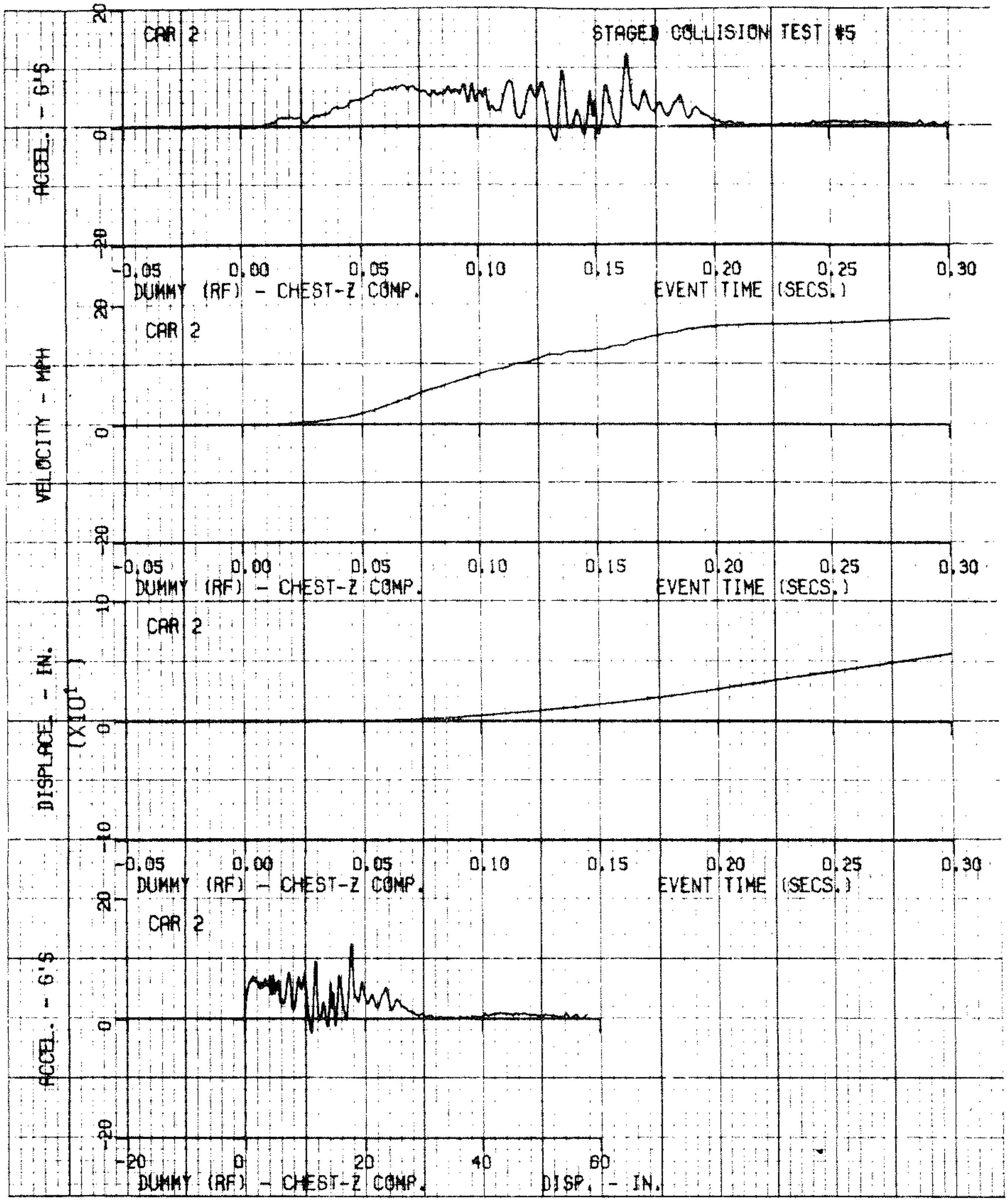
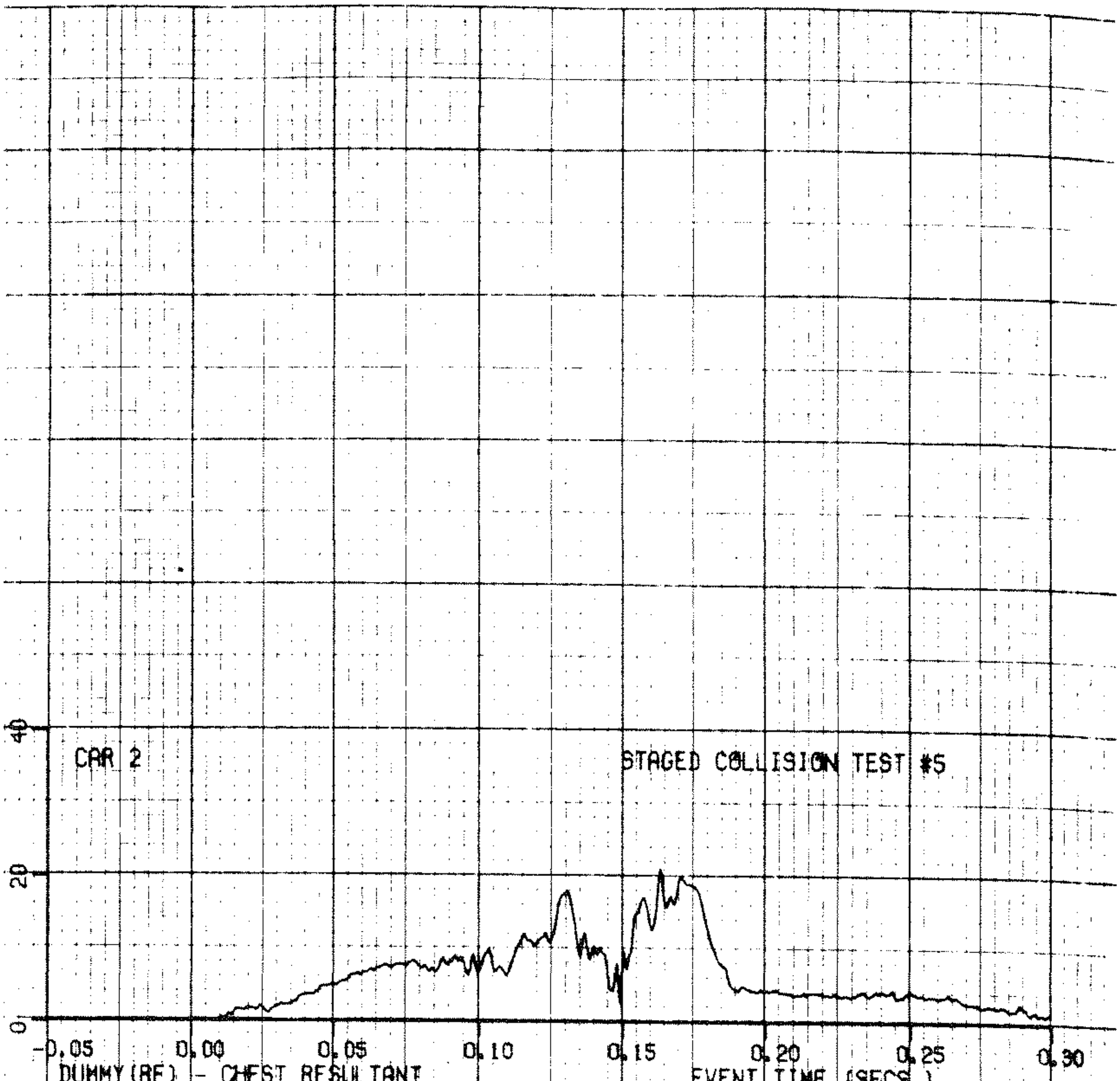
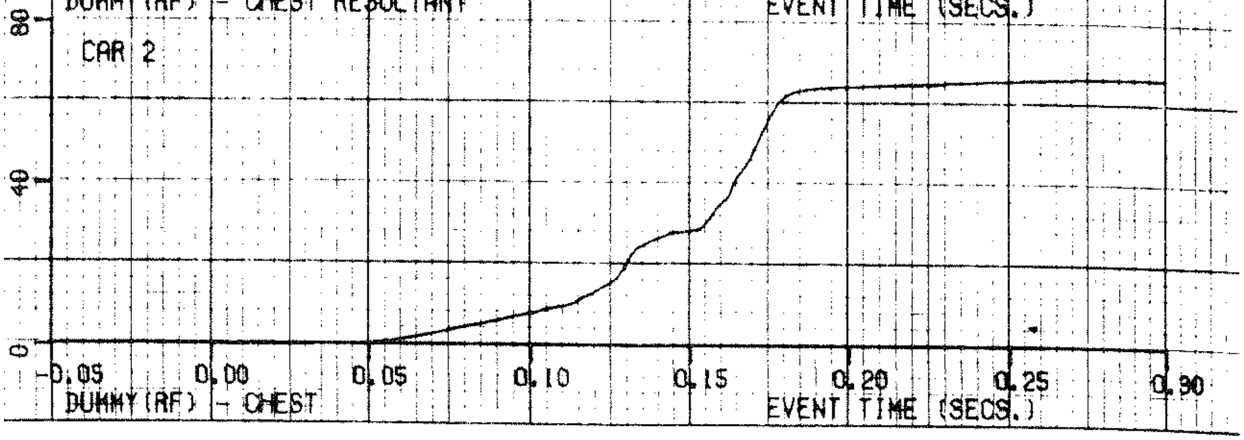
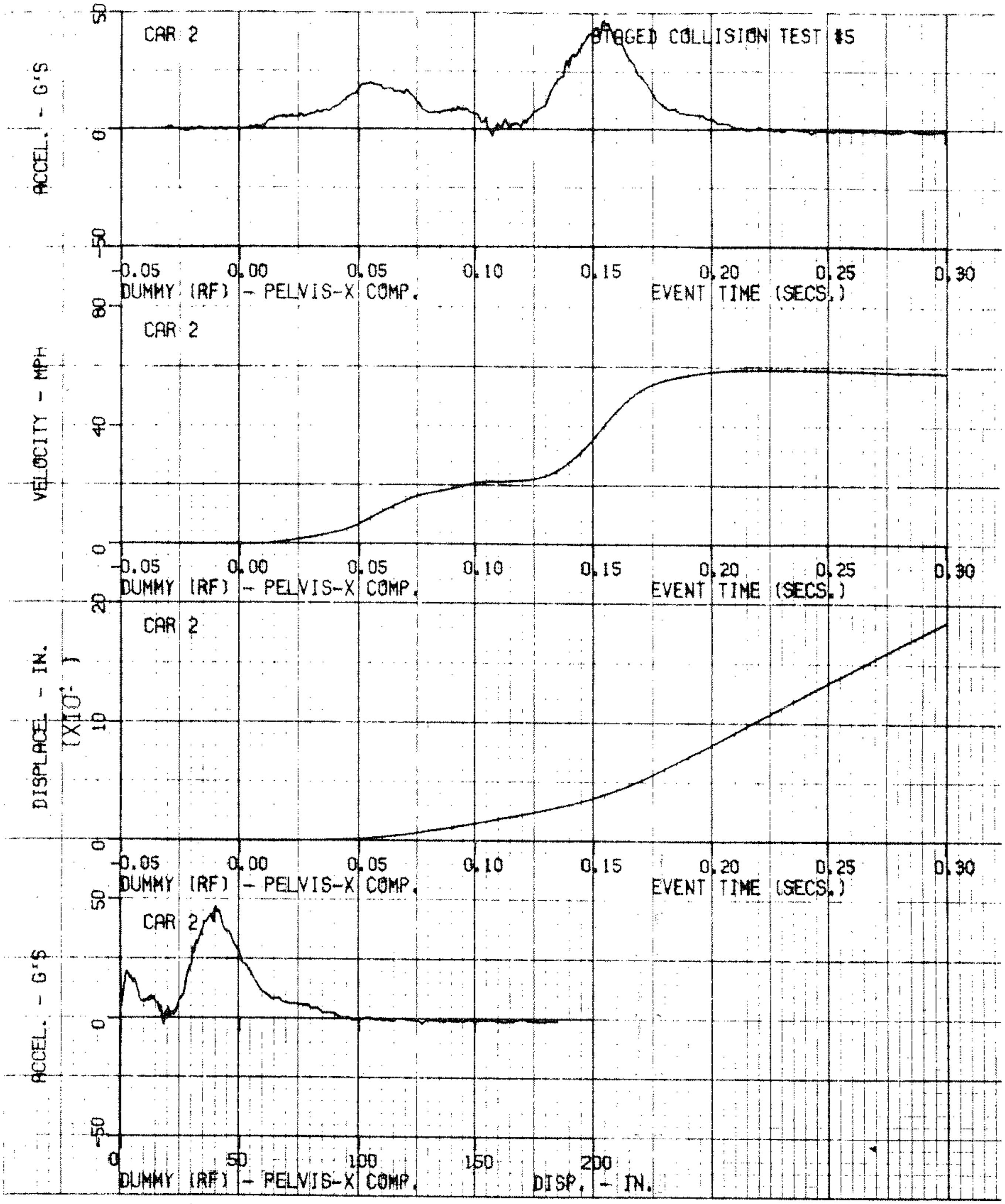

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
40
0
-40
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Y COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
0
20
40
60
DUMMY (RF) - CHEST-Y COMP.
DISP. - IN.

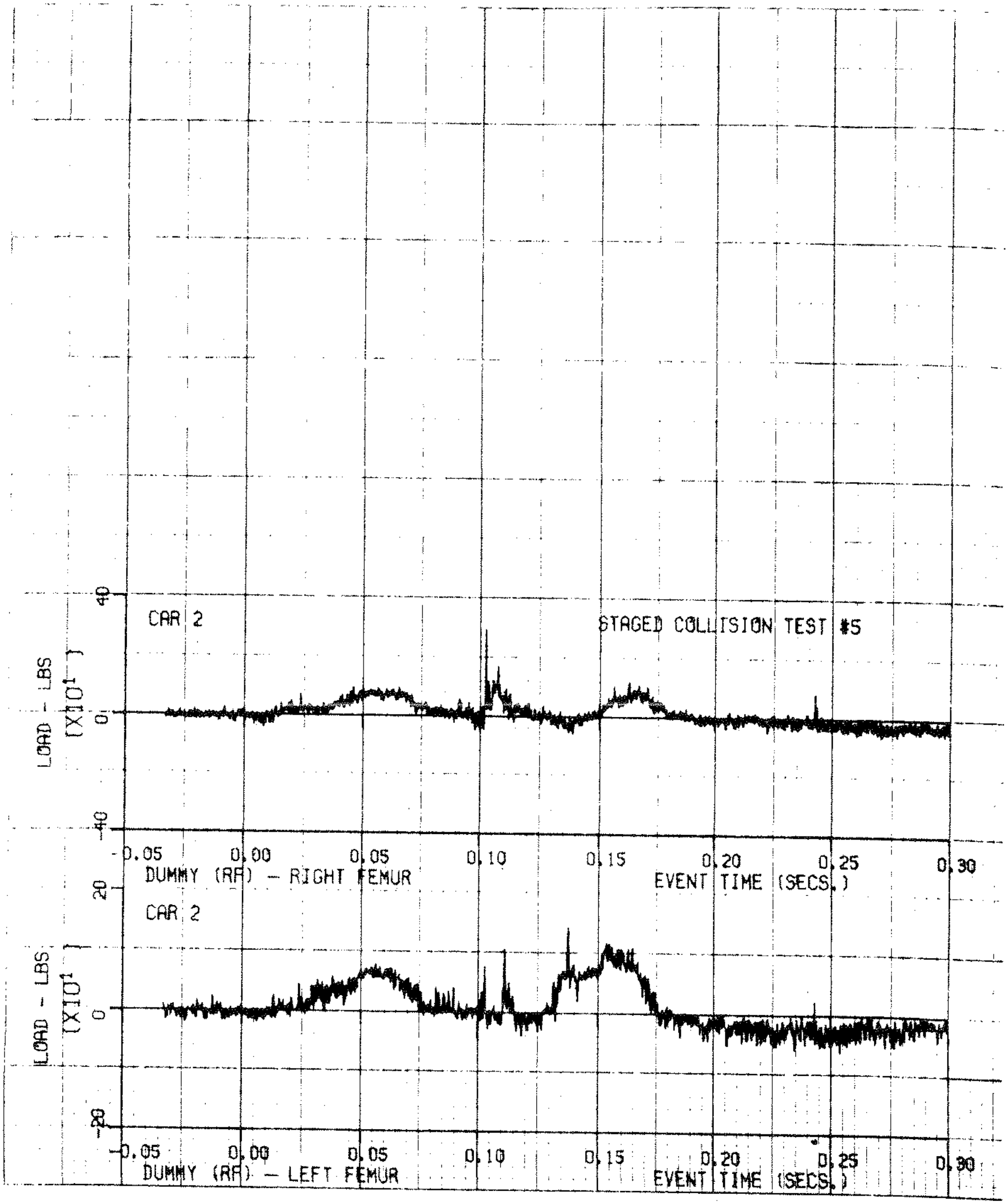

CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
20
0
-20
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACE. - IN.
(X10^1)
10
0
-10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST-Z COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
20
0
-20
-20
0
20
40
60
DUMMY (RF) - CHEST-Z COMP.
DISP. - IN.


CAR 2
STAGED COLLISION TEST #5
40
20
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST RESULTANT
EVENT TIME (SECS.)


CAR 2
80
40
0
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
DUMMY (RF) - CHEST
EVENT TIME (SECS.)

[redacted]


CAR 2
STAGED COLLISION TEST #5
ACCEL. - G'S
50
0
-50
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
VELOCITY - MPH
80
40
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
DISPLACEL - IN.
[X10⁻¹]
20
10
0
-0.05 0.00 0.05 0.10 0.15 0.20 0.25 0.30
DUMMY (RF) - PELVIS-X COMP.
EVENT TIME (SECS.)
CAR 2
ACCEL. - G'S
50
0
-50
0 50 100 150 200
DUMMY (RF) - PELVIS-X COMP.
DISP. - IN.



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